

The Commercial Car Journal

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A Talk to Dealers About the Commercial Car Business

Brains and Money Alone Will Not Insure Success in Business. There is Another Vital Consideration Necessary Which This Article Sets Forth

By C. A. MUSSELMAN, Treasurer and General Manager CHILTON COMPANY

HOW many motor truck agents throughout the country know the size of the automobile industry as a whole and the relatively important part that the motor truck plays in this great business?

The value of manufactured products in the automobile industry today totals \$2,725,000,000, and if there is added to this total the gasoline and oil sold through retail automobile units, the total volume of turnover in the automobile trade would be four billion dollars annually.

The yearly volume of business in motor trucks, equipment and replacement parts, plus \$150,000,000 in wages paid for labor in service stations, totals \$1,010,000,000.

Although the commercial car is an enormous industry, it suffers by comparison with America's leading industry—the automobile business—and that is the reason why, at times, motor truck dealers fail to show the enthusiasm for the business which it deserves.

Comparing a good proposition with the best is unfair to the good, and the sooner the dealer in commercial cars gets a vision of how important the motor truck industry is, instead of how it compares with the passenger car industry, the quicker will the dealer give his trade the respect it deserves.

Some idea of the dealer situation can be had by a consideration of the number engaged in selling commercial cars. The total, including Ford car agencies, is 23,000. Divide this total into three groups and you have a fairly good picture of the trade: Ford dealers, 8500; passenger car dealers selling trucks,

12,000; agents who deal exclusively in commercial cars, 2500.

There are 35,000 hardware dealers in the United States, 12,000 more than there are commercial car dealers; and when you figure the difference in the value of products it is easy to understand that what the truck trade needs is an improvement in sales methods and closer co-operation with the manufacturer for the sake of stabilizing the industry.

No man should be a dealer in commercial cars if the business has his brains, but not his heart. How often is it said

THERE will always be problems to confront both maker and agent and differences of opinion will always result in a certain amount of conflict; and when we strive for the ideal in relationship between the dealer and producer we realize that such a condition cannot exist universally; but each should strive for an understanding of the other's ambitions and should be considerate of limitations. Wherever the human element exists the ideal is seldom attained, but the road to success can be made much smoother if we learn tolerance, which means a due respect for the other fellow's opinion, a display of patience and a spirit of give and take.

WHEN both factory and dealer adopt these simple principles both gain a reputation for fair-play and the relationship becomes that of friendly co-operation and the success of both is more evident.

about a successful dealer: "He is a lucky fellow—made millions—but hasn't half the brains that I have." If true, possibly he had a love for his work and was successful because he has given it his best and not because he let the inanimate run the business—money—but failed to give it the life which is necessary to business—the heart.

You should remember that there are three elements that have a great bearing on a successful enterprise—capital, brains and enthusiasm, and that the latter comes from the heart. If you are in competition with men who have all three, and you supply only the capital and brains, you will find it very difficult to meet competition which includes enthusiasm.

Therefore, be it said unto dealers who wish to have a place in that part of the world's greatest industry which sells motor trucks, that you must put your heart into your work, for without it you cannot be successful.

Another thing to consider is: Are you forever going to criticize the other fellow for his poor business practices and yet follow his lead? Unprofitable trade-ins and all other things which are created by cutthroat competition are evils which you say will put the other fellow out of business, but which you condone in your own case. If there are any new leaves to be turned over and straight courses to be steered, why wait for your competitors to set the example when you yourselves realize the seriousness of the conditions?

There is a saying in the trade "that if you cannot sell trucks at a profit most of the time you will not remain in the truck business any length of time," and it is much wiser to build slowly on a profitable basis than rapidly on an unprofitable one, because there are only two ways to go in business—up or down, and you have the choice when you decide upon your business policies.

If you believe that the trade-in evils

and other things which eliminate profits from your business are the sort of evils to put truck dealers out of the running, why not let them be practiced by the other fellow so you will get rid of your competitors as quickly as possible?

You know that the commercial car business is getting better every day and the time is not far distant when dealers will be pushing the factory to make deliveries rather than asking them to withhold shipments, for unless all signs fail, the commercial car business is improving rapidly and the bugaboo of over-production and under-demand is rapidly disappearing.

Dealers should ever have before them the necessity for excellent service, because in the commercial car business the well-equipped shop is a better asset than a beautiful sales room, and if you are thinking of buying a new rug for your showroom, think twice, change your mind, and put the cash into modern tools for service work.

The methods of retailing passenger cars and commercial cars are quite different. In the case of the former, most of the customers go to the show-room of the dealer, while in the motor truck field the dealer must take his wares to the buyer's office. So the need of expensive stores is not in evidence in the motor truck field. By computing the amount of time and money expended to get a new customer

you will realize that each one obtained is a great expense. By inattention you quickly lose these customers and yet for very little you can retain their goodwill and patronage. Service is the answer.

If you want a little more enthusiasm about the business in which you are engaged, look at the truck industry today and then try to visualize what it will be ten years hence. The production of passenger cars is now nearly 2,000,000 annually. Ten years ago it was 199,000. The estimated production of commercial cars this year is 225,000, and compared with the production of passenger cars in ten years at the same stage of development, we find a much larger percentage of increase in motor trucks. Using this as a basis for calculation, is it not reasonable to expect a great expansion in this branch of the automobile industry?

The annual number of passenger miles on the steam railroads of the United States compiled from recent Government figures totals 47,000,000, while the number of passenger miles in automobiles, based on gasoline consumption shows a total of 114,000,000. This wonderful passenger transportation development has come about in 25 years, and as the passenger car industry is about ten years older than the motor truck business, it is reasonable to assume that there will be a wonderful cargo transportation development in the

next decade. Just how great will be this expansion no one can foresee, but using experience as a guide for calculation, it is within the realm of possibility to expect that the motor truck will fill an economic need to the extent of being a real rival of all other forces of transportation which will mean the rapid and steady growth in the production and sale of motor trucks.

Should not this be interesting to the dealer and give him another reason why he can afford to put his heart into his business? This vision should recommend patience and patience should bring its own reward, provided it is backed by progressiveness and commonsense.

It is always well to have faith in the business which is our life-work and to have that faith based on a logic which promises adequate returns. In view of the facts as presented, it is difficult to be other than optimistic about the future of the commercial car industry.

Most of the troubles in the commercial car business are based on wrong selling methods, many of which are the outgrowth of a forcing process on the part of the manufacturers. It is encouraging, however, to know that most of the leading makers of cars appreciate the evils of over-production and there is a growing tendency on their part to study more carefully the problems of their dealers.

Need for Greater Departmental Co-operation in the Industry

First S. A. E. Production Meeting Brings Together Large Array of Notables

THE Society of Automotive Engineers' first attempt to bring in closer co-operation the production man with all other departments of the industry proved most successful, opening up a field that has been hitherto neglected. These ideas formed the core of a two-day session of production men at the Hotel Statler, Detroit, October 26 and 27, many prominent officials known throughout the industry being present.

C. F. Kettering, president of the General Motors Research Corporation, struck the keynote of the convention when he stated at the Production Banquet that "hundreds of millions of dollars had been lost in the automobile industry because the production men was not called in when the engineers were drawing up their plans."

"In fact the production man and the designing engineer should be the two most closely associated men in the plant," he stated. "I believe we do not have to be secretive. Let the production man see it before it has gone too far. And the engineer should not be too finicky and set about having all the details of his plans go through."

"The question of costs, too, should be put into every line of drawing. If the accountant worked with the engineer and production man, he would be able to inject into the plans thoughts concerning

the fundamental economy of the job. If we considered more the productability and cost of a piece before design, we could then guarantee a lower cost on the product when it reached the final stage. Another prominent speaker, during the banquet, was Pierre S. duPont, president of the General Motors Corp.

"Great groups," he said, "in the automobile industry are struggling against each other only in imagination. In reality, we are all working together and what develops to benefit one of us benefits all of us."

A. B. C. Hardy, president and general manager of the Olds Motor Works, Lansing, Mich., made the principal address of the evening.

Mr. Hardy lauded the production man, declaring that 80 to 90 per cent of the territory of the factory was covered by him.

"College training can give the science of production but not the real thing," explained Mr. Hardy. "You get your experience along the line and you can pick your men from along the line. A production man must have stick-to-itiveness and backbone as well as brains."

B. B. Bachman, national president of the S. A. E., welcomed the production men to the meeting here and introduced Harold H. Emmons, who acted as toastmaster.

H. C. Alden, vice-president of the Tim-

ken-Detroit Axle Co., nominated for president of the S. A. E. for 1923, presided at the sessions Thursday and Friday mornings in the General Motors building.

The following addresses were made on Friday morning: "Problems Met in the Production of Air-Cooled Engines," William Dunk; "Some Experiences From a Production Notebook," H. J. Crain and J. Brodie; "Selection of Machine Tools," A. J. Baker; "Machine Tool Efficiency," R. K. Mitchell.

Friday afternoon inspection visits were made to the Cadillac Motor Car Co., the Packard Motor Car Co. and Dodge Brothers factories, visitors going to any one of the three they preferred.

Thursday morning E. Karl Wennerlund, of the General Motors Corp., gave a talk on "The Group Bonus and Its Application" and P. E. Haglund, head of the Ford foundry at River Rouge gave an illustrated talk on "Cylinders From the Ore to Finished Part." Two other papers written by members of the Studebaker Corp. of America were read.

Karl L. Hermann acted as chairman of the meeting and papers committee, and Kirke L. Hoagg acted as chairman of the factory visits committee.

About 500 attended the meeting and banquet.

Do You Overlook the Opportunities in Your Immediate Vicinity?

Nobody Yet Found the Pot of Gold at the Foot of the Rainbow. Stick Close to Home and Gather the Small Grain—They Accumulate

By FRANK H. WILLIAMS

"YES, we sell a large number of trucks all the time," said a successful middle western commercial car dealer, "and we never have any trouble finding prospects.

"How do we do it? How do we always have a big bunch of live prospects to work on?

"I'll tell you.

"We do it by the simple process of combing all the blocks in our immediate vicinity with a fine tooth comb for prospects all the time. We are at it all the time. We never pass up a single prospect. And as a result we're always selling cars.

"No doubt other dealers could use the same scheme with profit, so I'll tell you all about it.

"Take this block in which we're located for instance.

"I've found in my experience that many dealers seem to think hunting business far from their establishment is better than looking for it close at home. Time and again I've heard dealers talk about the fine business in some other section of the city than that in which they are located or in some town other than their own. Whenever I hear this kind of talk I always put it down that the dealer is passing up some good business close at home.

"With us our slogan is 'Business is best right at home.' And we follow out that slogan to its ultimate conclusion.

"There's another commercial car dealer in the block I just mentioned, and, to see the trucks of the various business houses lined up around this block at all hours of the day and way into the night you'd say off hand that this block sure was saturated with commercial cars if there ever was a block that was sold up to its utmost limit.

"But not us.

"Just a short time ago we took a census of this block. We found that there were fourteen retail stores, nine doctors, five hay and grain dealers, five dentists, four lawyers, ten insurance agents, two wholesale houses and five families.

"A pretty thickly settled block, isn't it, and yet it is no more thickly populated

with apartments and business houses than the ordinary block in the average city.

"After we took this census we made a house-to-house canvass of every single business establishment, business man and apartment on this block to discover whether there were any good truck prospects.

"What did we find?

"We found that the block was fairly alive with good prospects.

"We found, for instance, that although all the fourteen retail establishments had trucks, that in nine of the establishments the trucks were pretty well worn out and that it would be only a question of months

"The canvass eliminated the lawyers as well as the five families; it was proved conclusively that they were not prospective truck users. This knowledge also has its assets. But both of the two wholesale houses were actually in the market—one for a new truck and the other for a used truck. And among the ten insurance agents we found one agent who had a client who was looking for a truck.

"Right there in our own block that seemed, to all appearances, to be loaded to the brim with all the trucks it could possibly stand, we found all sorts of good prospects. And it took only a comparatively small amount of work to develop a number of satisfactory sales in this block.

"Not a bad piece of business, was it, to take that house-to-house canvass of our block?

"And the immediate sales we made to people in the block wasn't the end, either. From these firms and individuals to whom we made truck sales in our own block we obtained, by actual count, the names of five other prospects in other parts of the city. And to one of these five prospects we made an immediate sale without any difficulty at all.

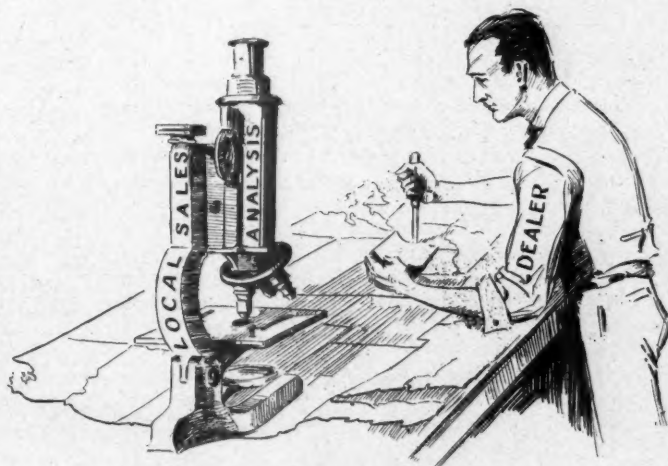
"Later we then widened our circle of canvass to include the four blocks facing the block in which we are located.

"Here again, it seemed as we were up against the saturation proposition. As before, it looked on the surface, as though every business in these four blocks was fully supplied with truck equipment, in fact, was over-equipped.

"But what did we find when we got down under the surface of things?

"We found trucks practically on their last wheels! Trucks that were hardly capable of getting around at all, trucks that had only about half a year more to go before being relegated to the scrap-heap, business houses that were under-supplied with trucks, growing business concerns that were contemplating taking on more business which, therefore placed them in the market for still more trucks.

"Naturally from all this we secured



Dig Out Your Home Prospects First

and, perhaps, of weeks before the owners of these establishments would simply be compelled to get new equipment if they were to continue delivering goods.

"We found, too, that one of the nine doctors was going into some sort of a mail order business and that he was starting up a good-sized laboratory and that he had great need of a truck to cart his stuff to and from the freight office and express offices and to the postoffice.

"Two of the hay and grain dealers had trucks which were in such bad condition that these merchants were ripe and practically ready to be sold.

"Although the dentists had no need for trucks, one of them volunteered information as to the need of a brother-in-law who was in the grocery business, and who was in the market for a second-hand truck.

quite a number of prospects, from which developed many valued sales.

"Again, in the case of these four blocks, we secured the names of other prospects in other parts of the city, many of whom also were eventually sold.

"Now, understand me, we weren't swamped with the business we secured from these four blocks. We didn't have to expand our garage or take on any other lines of trucks to keep pace with the demand, or anything like that. But in a slack time of the year when, ordinarily, our salesmen and myself would have been howling about bad business, we did an

amount of business which was satisfactory indeed—business that was doubly satisfactory, because we dug it up ourselves in territory where, if anyone had previously asked us, we'd have said there wasn't a chance in the world of selling a truck.

"From now on we're going to pursue the block to block plan, first canvassing each block with scrupulous care to establish actual commercial car conditions, and then following up every live prospect with as much energy and enthusiasm as we can bring to bear.

"All this has lead me to feel that when

a commercial car dealer talks about business being fine in some place where he isn't operating, he's simply passing up as good, if not better opportunities close at hand.

"Work close at home. There's a lot of business in your immediate vicinity if you'll only find out where it is and then go after it in such a way that you'll get your share of it.

"Get the under-surface facts as to actual truck conditions in your immediate vicinity. They'll surprise and inspire you to greater sales effort.

"Try this plan NOW!"

Why the Truck Dealer Should Handle Tires

IN this publication we have repeatedly advocated the handling of motor truck equipment by the dealer. Of course some truck dealers are handling equipment and making a nice profit from the same. But the large majority have not yet seen the light, so to speak. They feel that they have enough to do selling the truck chassis and they let some one else sell the equipment.

The fact of the matter is that there is hardly another industry in which a similar condition exists. There is no logical reason why the truck dealer should not sell tires to his customers just the same as he sells other parts. In fact it would place him in a position for overcoming one of the so-called evils of the truck industry, namely, overloading. The dealer could council with the truck owner when he attempts to use tires not suited for the particular sized vehicle he operates.

By stocking a certain number of pneumatic sizes, the average truck dealer would be in a position to supply tires for practically sixty per cent of all the commercial vehicles on the street. In other words, by stocking the smaller size tires, such as the 30 x 3½, 32 x 4, 34 x 4½, 36 x 4, etc., he would be in a position to sell to most motor truck owners using motor trucks from one-half to 2 tons capacity. Many truck dealers could sell tires and make a neat profit if they would stick to those sizes which are in greatest demand. Some dealers are laboring under the impression that the stocking of truck tire necessarily means the handling of the so-called large pneumatics. Of course, the dealer who sells large capacity trucks should take care of his customers by keeping a certain quantity of larger sizes, both pneumatic and solid, on hand. The average truck dealer will do well, however, by stocking such sizes for which there is a ready demand.

Anti-Skid Chains

With winter approaching the necessity for anti-skid chains is apparent. Many truck dealers are losing a nice margin of profit by not stocking a list of tire chains.

It makes no difference whether the dealer is situated in a small town or in a metropolis, every truck in active service requires and should be equipped with a set. One of the largest taxicab companies in the country insists that every one of its cabs carry a set, winter and summer. The slightest rainfall makes it incumbent upon the driver to put on the chains.

For the dealer to reap a nice profit incident to the sale of chains, and other similar necessities, does not require the outlay of large capital. There are quite a number of specially designed chains now on the market made particularly for truck service.

Many of these, especially in the smaller sizes, are also suitable for passenger car wheels. Hence, the dealers handling both trucks and passenger cars have no excuse for not carrying them. Chains wear out very rapidly in actual service, consequently the replacement factor is high. A few years ago a protracted snow spell hit the eastern part of the country. One Philadelphia coal concern kept its trucks in operation day in and day out despite the adverse going. During this time the concern averaged about a set per truck per day. Chains prevented this company from slipping behind on its deliveries.

Every truck and passenger car owner is a prospect. The truck dealer should make a decided effort to interest his customers in the advantages of their use. They will save useless wear on the tires by preventing spinning of the wheels. Their judicious use will naturally minimize gas and oil consumption, and last, but most important of all, the accident hazard will be reduced.

Anti-Freezing Compounds

Anti-freezing compound is another product for which there is a great demand every winter. Many truck dealers seem inclined to let the owner take care of this in whatever manner he sees fit. The dealer thinks the owner will buy whatever he wants to, anyway and wherever he feels like it. Perhaps he does.

The only reason he does so is because the dealer doesn't make it his business to sell him first. The average owner is like the average dealer in this respect. He waits until a slight freezing spell puts a few little cracks in his radiator. Then he hustles to the first place he thinks of and buys some kind of a radiator anti-freeze solution. He may get the right thing or he may not.

But, suppose the truck dealer had written a letter to all the owners on his list a few weeks before the cold weather set in, advising those owners to bring their trucks around and get their trucks fixed up with anti-freeze compound. It's dollars to doughnuts that the owner would at least remember the dealer's solicitation and let him take care of the matter rather than drop into the first place that sells an anti-freeze solution.

The truck owner doesn't think of these things when he ought to. He is perhaps using that truck every day, and he lets such jobs go until the very last minute. The dealer ought to keep the owner advised. He can make money doing so. He won't make a fortune to be sure, but he surely can make a good profit from the sale of such compounds, but primarily he will convince his customers that he is taking an interest in their vehicles and thereby keep their good-will.

Radiator Equipment, Anti-Freeze, Etc.

Radiator hose connections may also need renewing at the same time that the cooling system is being filled with an anti-freeze solution. A stock of hose connections, hose clamps, radiator rust preventives, anti-freeze solutions, chains, tires, etc., are all equipment which any dealer can carry without incurring a great deal of expense.

The Hood Hubber Co. reports sales for both tires and footwear running well ahead of last year. For the first nine months of 1922, sales were practically \$18,100,000 compared with \$17,218,416 in the corresponding period of 1921.

What the Motor Bus Has Done for the Inhabitants of Westchester County

Don't You Think, Mr. Dealer, That a Tidy Profit Awaits the Motor Truck Dealer Who Not Only Visualizes the Public Utility of, But Fosters and Creates a Crosstown Bus Service Neglected by City Traction Facilities?

By C. P. SHATTUCK

WESTCHESTER County, N. Y., begins about 10 miles north from the Grand Central Station, New York City. It is bounded on the west by the Hudson river and on the northeast as far as the Connecticut line by Long Island Sound. Along the river are residential towns and cities, these being fairly close together until Tarrytown is reached. This section is served by a railroad which parallels the river. Another railroad serves the towns and cities on the sound. Midway between the river and sound, and paralleling the river and sound residential sections, is another string of towns and cities. These are served by another railroad.

Where Common Carriers Fail in Service

Service from New York on any of these lines is fairly good if one travels North or South, but should one desire to cross from any of the river towns to the central or sound towns he must journey practically back to New York. In the lower section of Westchester, Yonkers and Mt. Vernon, for example, there are trolleys which cross but the service is held to be very poor. In fact, one can save time and temper by utilizing the railroads. These facts are mentioned to introduce one of the reasons why the motor buses are strongly entrenched in Westchester county and why new routes are being developed, despite the subtle antagonism of the trolley line interests.

With the exception of Yonkers and Mt. Vernon the various small cities and towns are largely residential, commuting places. While many own passenger cars, a large number do not. So when Mr. Suburbanite in a river town desires to visit a friend in the central or sound section, he is, or rather was, confronted by a tedious journey. But the motor bus has changed this and it is now possible to cross from river to sound, and return, by bus, quickly and much cheaper than by the common carriers.

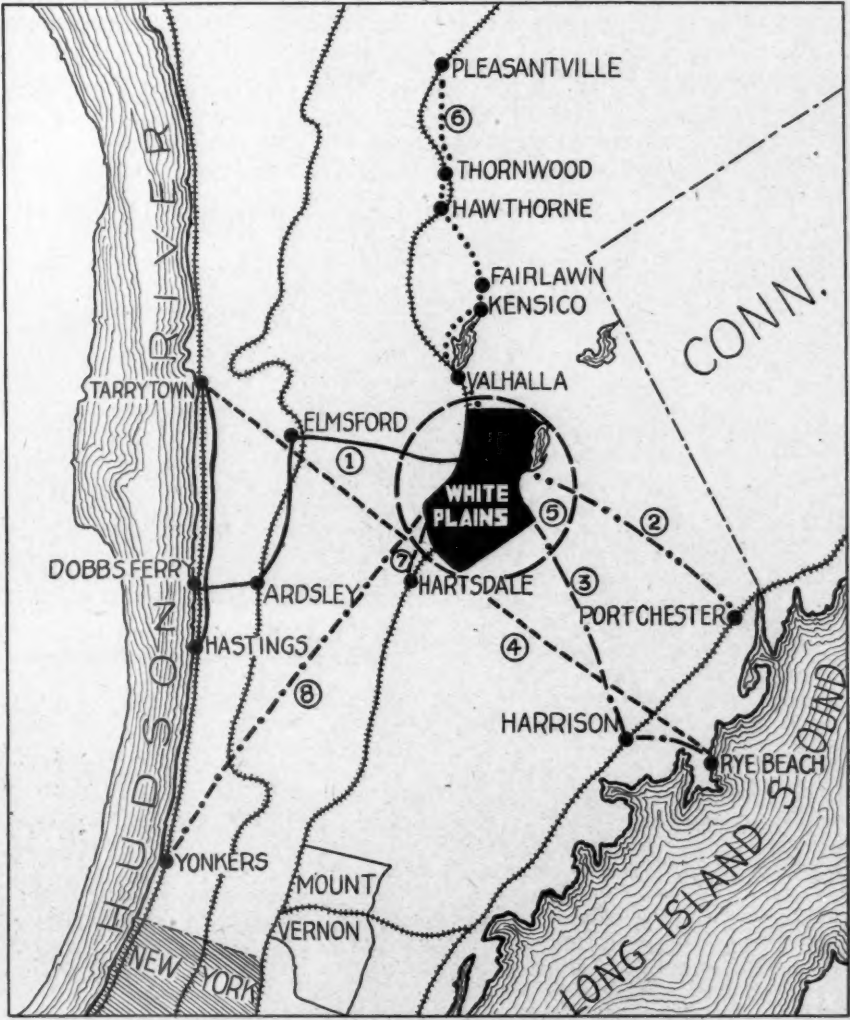
The Opportunity for Buses

White Plains is about midway of the central towns referred to and being the county seat various professions transact business there. The attorney from Rye, on the sound, for example, formerly found it more convenient to use the common carriers to Mt. Vernon than take the

central section train to White Plains. The Yonkers lawyer with a case in court at White Plains had to take a long and tiresome trolley ride to Mt. Vernon, then the train to the county seat. Similarly the residents of the river section desiring to visit the shore—sound places—in summer were confronted by a tiresome ride, delays and considerable expense. This

lengthy explanation is made to show why the motor bus is meeting with favor with the public in Westchester despite the fact that the common carrier interests have and are using subtle methods to combat the bus.

It was not expected that the steam and electric railroads, the New York Central, N. Y., N. H. & H., etc., would build



- ① ——— White Plains to Elmsford, Ardsley, Dobbs Ferry, Hastings-on-Hudson, Tarrytown.
- ② - - - White Plains to Portchester.
- ③ - . - White Plains to Harrison, Rye Beach.
- ④ - - - Tarrytown to Rye Beach
- ⑤ ——— White Plains (Sound View Transp. Co.) from depot to outskirts not served by trolley.
- ⑥ White Plains, Valhalla, Kensico, Fairlawn, Hawthorne, Thornwood, Pleasantville.
- ⑦ - - - White Plains, Hartsdale (loop).
- ⑧ - . - White Plains, Yonkers.

cross lines. The traffic would not warrant it. But it would be expected that the electric traction companies operating in the town would connect the river, central and sound towns but, like many trolley concerns, they are having troubles of their own. Extensions or cross town lines are not to be given a thought. Judging from reports, the trolley companies are having a difficult time even with increased fares. Their future in Westchester is none too bright for with new bus lines being added and the more general use of the passenger car for transportation the receipts are falling off and service is not what it should be.

Buses Supply Service

At the time this article was prepared there were eight different lines of buses using White Plains as a central terminal. These lines radiate as do the spoke from the hub of a wheel. There is a line running from White Plains to Elmsford, Ardsley, Dobbs Ferry, Hastings-on-Hudson and Tarrytown. It parallels the trolley line only as far as Elmsford, a very short distance, but residents of this place favor the bus because of the time saved.

Another line operates to Portchester, a sound town, some seven miles from White Plains, and a 20 minute schedule is maintained even in the winter.

Another company runs its buses to Harrison and Rye Beach, the last named a popular summer place. The residents of Tarrytown who wish to visit Rye Beach, or Rye, can take a bus at Tarrytown and reach Rye very quickly.

Another line operates between White Plains and Yonkers, and there is much traffic between these places.

Another company, which has \$60,000 invested, operates buses from White Plains in the central section, serving North White Plains, Valhalla, Kensico, Fairlawn, Hawthorne, Thornwood and Pleasantville. This is an exceedingly popular route for there is no trolley service. Four 29-capacity buses are required to meet the demands. Pleasantville is about 15 miles from White Plains. So popular

are the buses that when it was proposed to change the route the residents along the line kicked long and strenuously. It is doubtful if the trolley company would earn enough to pay for current should they start a line which, of course, they won't.

Hartsdale, a few minutes run from White Plains on the train, is served by buses which make a loop serving residential sections where residents either walk or use their cars. There is still another line operating from the depot at White Plains and serving the outskirts of the city.

Service Held to be First Class

The schedules maintained by the various lines give very good service, some operating on a 20 minute basis. It is said that the White Plains-Pleasantville line runs so exactly to schedule that the residents set their watches by the arrival and departure of the cars. With the exception of the short run of the line to Elmsford, the buses do not parallel the trolleys, so it will be seen that the buses have opened and developed new territory.

Franchises are given bus companies. Those contemplating a line must file a petition with the common council of White Plains, stating the type and seating capacity, schedule of tariffs, and show that the proposed line is a "public convenience and necessity." In other words, the consent of the local authorities must be obtained. Next the Public Service Commission enters the case and if the opposition from "other interests" is not too

strong, a certificate, which amounts to a franchise, is given, and the line is all set to go. The city of White Plains does not require bus operators to file a bond to insure the safety of the passengers, but the writer was given to understand that insurance is carried by the companies. According to the commissioner of public safety, of White Plains, who has more or less control of police matters, the buses are giving good service and employing careful drivers. No complaints have been received, said the commissioner. Owing to the narrowness of the principal street the buses are not allowed to operate on the main thoroughfare, but use cross and parallel streets. Parking stands are provided by the city.

No jitney Competition Permitted

After a line is in operation no franchise or permit will be given to another concern or bus to operate on the same route. This protects the original investment. The tariffs are reasonable and are slightly in excess of those charged by the railroads. The first line was established about 1916. Snow does not interfere with the service. Tractors and plows are employed to keep the roads open.

There is every reason to believe that as new sections are developed that the various bus companies will extend their lines to serve the new sections. Within a reasonable time it will be possible to reach any point in Westchester county by motor bus and much quicker and more comfortably than by the common carriers.

It would be interesting if cost figures having to do with the operation of the lines could be supplied, but they were not easily obtainable. Inasmuch as the runs are short and roads good there should be no reason why a reasonable return on the investment is not possible.

The point the dealer should consider from this article is that there are many counties like Westchester in the United States where there are opportunities for profitable bus lines. Investigation in many of our larger towns might reveal a surprising lack of passenger transportation facilities.



Another 29-Passenger Capacity Bus Has a Steel Body and Dual Pneumatics on Rear Wheels



This Bus Serves as a Connecting Link Between the County Seat and Harrison and Rye, on the Sound

This Selden is No. 9 of the fleet operated by the company and is equipped with giant pneumatics



One of the Fleet of Motor Buses Serving the Outskirts Where Trolley Service is Lacking

This GMC has traveled 41,000 miles to date and makes its terminal at the railroad depot

Co-operation vs. Competition

Between

Motor Truck and Railroad Transportation

An Address by W. H. LYFORD, Vice-President Chicago and Eastern Illinois Railway Company, Chicago, Before the Second National Conference on Education for Highway Engineering and Highway Transport, Washington, D. C., October 28, 1922

THE transportation of goods is an absolutely essential requirement for the family, industrial and commercial life of a civilized people. The furnishing of transportation is sometimes considered a function of the government, but the people of the United States will not permit the government to perform transportation, except through the mail service and for packages weighing 70 lb. or less. All other transportation of goods must be performed by the person requiring it, or by a carrier for hire. This discussion will be confined to highway and railway transportation of goods for hire.

Complete Transportation

Transportation is not complete until the goods are moved all the way from the premises of the shipper to the premises of the consignee, and, for brevity, we will call such movement "complete transportation." Also for brevity, we will use the British term "trader," which includes both shipper and consignee, or all persons for whom transportation of goods is furnished for hire.

The trader is concerned only with complete transportation. His greatest need is that complete transportation shall be furnished with regularity and within reason-

the duty of carriers who, singly or jointly, undertake to furnish complete transportation, to make their charges as low as is consistent with the maintenance of adequate, regular and prompt service.

Four Classes of Transportation

We are accustomed to think of the transportation of goods as divided into four general classes: parcel post, express, less-than-carload or package freight (commonly called l. c. l.) and in carload freight.

The importance of cutting down the idle time of cars is shown by the fact, which I believe can be established, that the average time required by a freight car, in carload freight service, to make a round-trip is about 20 days, and of that time, the car is actually moving in line haul, loaded or empty, only 2 2/10 days, and it is actually earning revenue only 1 1/2 days out of the 20 days required for the round trip.

The essential difference between carload and l. c. l. freight is that carload freight is loaded and unloaded on an industry track or a team-track by the trader, or by someone employed by him, while l. c. l. freight is loaded and unloaded and passed

owner of trucks or teams, whom we will call "the trucker."

Because the railway does not furnish collection and delivery and that service must be performed by or at the expense of the trader, the traders have located their industries as close as possible to railway stations. Consequently, the vicinity of the freight station is usually a congested district in any large city. If the railway furnished collection and delivery, the location of the freight stations would be immaterial to the trader. A dis-

tance of two miles between the locations of two stations in a large city may make a difference of 300 per cent in the interest charges on the real estate occupied by the stations. In Chicago the interest charge alone on real estate at 12th St. on which a freight station is located, is more than \$2.50 per ton of freight handled through the station. If the station were located at 33rd St., such interest charge would be reduced to about 80 cents per ton. The amount of interest saved by moving the station to 33rd St., would pay the cost of well organized cartage between the 33rd St. station and the premises of the trader. The present cartage charges would be saved.

Another field for the profitable use of the motor truck is the transportation of freight between communities which are served by branch lines of railway, on which the traffic is too light to pay the expenses of any kind of railway transportation. Such branches are almost innumerable and are scattered over every part of the country.

able time. His secondary need is that the charges which he must pay for complete transportation shall not be more than the traffic will bear, without curtailing his profitable trade.

Complete transportation cannot be furnished regularly and promptly unless the charges of the carrier are high enough to pay all the expenses of carriage and a profit sufficient to warrant the investment of capital and energy in the installation of the transportation service and in increasing the service as traffic increases. In normal times, the volume of freight traffic in this country increases at a rate of not less than 6 per cent per year.

The trader is entitled to the best transportation service which can be furnished for the charges which he pays and it is

through a station, at the expense of the railway. Consequently, carload rates are substantially less per ton than l. c. l. rates, for carrying the same goods.

Collection and Delivery

Whether the government, the express company or the railroad company undertakes to transport the goods, the railway actually performs the entire transportation service, except the movement between the premises of the traders and the stations of the railway companies. Such movement is called "collection and delivery." Parcel post is not collected, but it is delivered by the government. Express is collected and delivered by the express company. Freight is collected and delivered, not by the railway company, but by the trader or by the

Eliminating Storage Need

Outbound freight is moved to the station in whatever way and at whatever time the trader chooses, during the business day. Inbound freight is removed from the railway station in whatever way the trader chooses and, on the average, about three days after the freight arrives. Therefore, the station becomes a storage warehouse, congested with piled-up freight awaiting delivery to the trader, at his convenience. With collection and delivery service controlled by or in full co-operation with the railway, large freight stations with storage facilities would be unnecessary. A narrow platform, with a roof over it and with tracks on one side and a highway on the other, is all that would be required.

With very few exceptions, railway freight stations in large cities already are so congested that, unless we can find some way to pass more traffic through the existing facilities, or to keep on enlarging and multiplying them, by extravagant expenditures for additional real estate and track connections, the railways will not be able to handle the normal increase in freight traffic.

with the railway for the carriage of packages weighing 70 lb. or less, and the trucker competes with the three other agencies.

Competition for the local carriage of goods within city and suburban areas ought to be welcomed by the railways, as they perform this service at an actual loss, while the trucker can perform it at a profit. On the other hand, competition

ways are entitled to earn. Still the tendency of the Commission is to reduce rates and there is no reasonable hope of increasing them.

Disregarding the temporarily bad condition of railway equipment resulting from the existing strike of the shop crafts, the only limitation on the volume of traffic which the railroads can move is due to the railway terminal facilities which are inadequate to take care of the traffic which easily could be transported over the main lines of railway.

Competition for the local carriage of goods within city and suburban areas ought to be welcomed by the railways, as they perform this service at an actual loss, while the trucker can perform it at a profit. On the other hand, competition with the railway for the carriage of goods through rural districts, along main lines of railway, is harmful to the railway and unprofitable to the trucker.

Railway companies are organized to furnish transportation. Storage is a separate field for enterprise. The public warehouse is needed and should be fostered because it can be operated at a profit. Storage in railway stations rarely is profitable to the railway company and it seriously interferes with the legitimate function of the railway—transportation.

The fields within which complete transportation of goods can be furnished by highway alone or by railway alone are limited.

There are very few industries or residences in continental United States which are not connected with each other by highway and it is physically possible to perform complete transportation of goods by highway, between almost any two industries or residences. But such transportation is most economical only when limited to the movement of goods between homes or industries which are within reasonable trucking distance from each other. The determination of such reasonable distance depends on many conditions and a competent truck expert will place it anywhere between 25 and 150 miles. Of course there are emergencies and peculiar industrial conditions which, in rare cases, make trucking economical over a distance of several hundred miles, but such cases are negligible in the consideration of the whole field of highway transportation.

On the other hand, comparatively few industries and practically no residences are connected with each other by railway. Therefore the field for complete transportation of goods by railway is restricted to the movement of carload freight between these industries which have direct rail connections. In that limited field the railway is the most economical means of transportation. A fair example is the movement of coal from mine to an industry located on a side track.

Competition

In this country, four different agencies are competing with each other for the transportation of the same goods: Parcel post, the express company, the railway and the trucker. While the parcel post and express are transported over railways, the government and the express company compete with each other and

with the railway for the carriage of goods through rural districts, along main lines of railway, is harmful to the railway and unprofitable to the trucker.

Co-operation

For parcel post there is complete co-operation between railway and highway transportation, as the government has its own cartage system. There is like co-operation in the express business, as the express company operates its own trucks and wagons. For freight traffic, there is hardly any co-operation between the railway and the motor truck.

I have marshalled the foregoing facts, without any idea that they would be new to you, but that they might form a back-

I will go further and state that I think that all such money-losing branch lines, along which transportation by truck over existing highways could be furnished at less expense, should be abandoned. The better and less expensive truck service should be substituted by the railroad company, if the trucker will not occupy the field.

ground for the statement: THAT UNLESS THERE IS A RADICAL CHANGE FROM PRESENT PRACTICES IN RAILWAY TRANSPORTATION IN THE UNITED STATES, OUR GREAT TRANSPORTATION SYSTEM, WHICH IS THE WONDER OF THE WORLD, WILL BECOME A HINDRANCE TO THE FURTHER PROGRESSIVE DEVELOPMENT OF THIS COUNTRY.

Rate Question a Problem

Five years ago, when our railway system was placed under Federal control, its march of progress was halted and it has never regained its stride. Its development has not kept pace with the industrial development of the country, because its revenues have not been sufficient to attract the additional capital necessary to finance the cost of normal additions and betterments to road and equipment.

The public is clamoring for lower rates, while existing rates are not high enough to produce the net railway operating income which, as determined by the Interstate Commerce Commission, the rail-

terminal facilities, and an unreasonably large supply of freight cars.

Third—The use of box cars for the transfer of l. c. l. freight between railway stations in large terminal areas. **The trucker could perform that necessary service more quickly and economically.** Thousands of box cars thereby would be released from an unprofitable service and would substantially increase the carrying capacity of the railway.

Fourth—The use of box cars as trap cars, for moving l. c. l. freight through terminal areas for industries which have rail connections, and the iniquitous absorption by the railways of trap-car, subway, and lighterage expenses, which is equivalent to furnishing free cartage to the favored few large traders, in discrimination against the average trader, who is obliged to provide or pay for his own cartage.

Fifth—The operation of branch lines on which the traffic is too light to sustain railway transportation and **which could be served better and at far less expense by the motor truck.**

(Continued on page 68)

A Dealer's Viewpoint of the Present and Future Sales Possibilities of Trucks

By BEVAN P. Y. JORDAN

Vice-President and General Manager of Traffic Truck Sales Company, Philadelphia

SINCE the World War, trucks have firmly established their importance in this great country of swift transportation. Since 1917 the growth has been enormous, reaching into figures that rather stagger the average mind. This and the ensuing year, will see no decrease—rather an increase. The potential possibilities of motor transportation, the subsequent low cost of high-grade units and their maintenance, with the ever-increasing highways, (appropriations from all states now nearly reaching one billion of dollars), are the three sure factors that will permit trucks filling the present gap in our national transportation system.

Though young, the truck industry is generally conceded for its importance; not alone by those who have contributed to its present standing, or by those who have profited as its consumers, but particularly by those who have aided in the readjustment movement, who take cognizance of the economy of truck transportation.

Gaps or leaks in either industry or organization are the first enemies to be eliminated, to secure low and basic levels. The transportation system of our country is receiving its due share of consideration in pulling down prices to normal.

Know Transportation; Study It

The truck manufacturer realizes as does no one else, unless he has made a study of transportation—that the gap between producer and consumer is measured by miles—ton miles. The city, borough, county and highway haul is the all important part in linking the manufacturer, buyer, and the seller of any commodity.

There is, of course, no intention for ignoring the railroads. They were the first great transportation developer of the nation. Waterways have played their part too, though somewhat restricted—especially from the standpoint of speed.

What of motor trucks? The powerful, speedy, economical, untiring ever-abused motor truck? The motor truck has increased tonnage, saved spoil-age in transit, moved crops swiftly, and without loss, saved breakage, especially through rehandlings, prevented shrinkages of live stock, and at costs that defy another of its competitors.

Each day is bringing forth some new event that forms another chapter in the already large volume of transportation history, written by the motor truck. Its diversified plans of endeavor, successfully expedited are adding many new phases to the national need for a perfected system, clock-like in precision, swift in operation and low in maintenance.

Retail truck merchandising offers more to the dealer and consumer for 1922-23,

than perhaps at any period since its inception. Reasons that are practical and logical, which this article is intended to set forth, do not necessitate much optimism to conclude belief in their soundness.

Better trucks—yes, the best truck, that manufacturers have heretofore built is being offered. Aside from the mechanical improvements that grew out of the World War period of truck building, the year ending has contributed much technically and otherwise, that has cemented more closely the confidence between truck user, dealer and factory.

Many Merchants Still Unconverted

Innumerable merchants are yet to be converted to the use of motor transportation. Truck performance, as rendered



Bevan P. Y. Jordan

to the brothers of those "non-converted users"—has taken the place of thousands of dollars of advertising in convincing those, who have yet to realize the importance which the modern truck plays in our national transportation system. They are daily seeing undisputed evidence of efficiency and economy that no other delivery medium can fulfill. Their numbers represent a class, who if only alone were to be sold—could treble all past production records.

Show User Ton-Mile Cost

The "general utility purpose" of the truck as first sold to the customer, whether the capacity suited his needs or the price of his pocketbook, was of little concern in the early stages of truck merchandising. The contrary is quite the case now—at least insofar as the dealer and manufacturer endeavors to fix permanency as a fundamental of its organization.

Successful retailing for 1923 must include a sales policy that will logically, tersely and concisely place facts before the consumer, to measure his investment in the actual ton-mile cost. Nothing but a close study of the prospect's needs, visualized even to the extent of his financial standing will suffice, if the future truck dealer is to secure his full share of business.

The farmer and farm, is not to be omitted, as being immune from the same necessity for studying conditions, as required for the city prospect. In fact, in past years too many dealers neglected the rural outlet for sales, either because they accepted the general belief that there was no rural business, or wilfully failed to even make the slightest effort to secure it. However, normal or abnormal the condition, one outstanding fact regarding the farm is true; that the shortage of manpower has been increasing yearly. No single factor will as efficiently or quickly offset this deflection, as the motorization of the farm. Its general inclination toward development for 1923 will far exceed 1922—regardless of the crop aspect.

Bus Field Unlimited

Bus and express lines offer another avenue of revenue and great opportunity from their already fixed standing, as factors of transportation. In this connection, it might be well to mention that the increase of the Rural Express and Bus, throughout America in the last two years, has itself been an outstanding feature in the development of the use of motor trucks. There is unlimited ground to cover in this direction, owing to the comparative youthfulness of the enterprise. In the past, few states, especially those in the East, have failed either by Acts of Legislature to provide permits for a franchise, or their Highway Commissioners have not seriously considered proposals in this direction, or sufficient influence has not been brought to bear before the proper authorities. Several cases have come to the writer's attention, where bus sales were made covering rural points, when the dealer not only sold his trucks, but organized the company and secured the franchise. Any progressive dealer can select almost at random points in his territory outside of the big cities, where a Bus-Express service could profitably be established.

Public demand is daily creating new passenger service in cities throughout the country, and it remains for this or that dealer whose territory is still virgin, to include this field of endeavor as a part of his 1923 sales program. There are reported to be five-thousand regularly

organized and operated motor express and bus lines in America. These transportation companies are incorporated for large sums of money, and are being managed and run more and more according to railroad standards. The number decreases greatly when reflection is made of the vast territory open, which has yet to see and be able to utilize this advanced medium of transportation.

There need be no camouflaged optimism, or heralded facts implying fallacy—

for the truck dealer of 1923. True, much work is to be done, and the majority of buying must be created, with the intensification and premediation, the writer has hoped to illustrate by this article.

The propaganda of economical stress has saturated the layman to that point, where it is only logical and rational for him to look toward another horizon for his buying market, as has already been indicated by a leading figure of Industry when he said, "The Country is again

going to work—the majority are already hard at it."

It is buying what it needs from the result of its work. Financial surplus has already asserted itself, with each day increasing the "Pot."

1923 can be made a precedent in the annals of motor transportation, if you will so elect and if those identified with the industry will but further intensify their efforts.

Battery-Equipped Trucks Increasing

IT is a well-known fact that the average battery used for ignition, starting and lighting purposes on motor trucks does not stand up for as long a period as the same battery would on a passenger car. This is not because of any inherent defects in the battery itself, but because of the harder conditions of service under which a battery must labor in the truck service.

The following table shows the production of battery-equipped commercial cars in 1920 and the estimated production for 1922 and the total number of battery-equipped commercial cars in use today:

Based on recent field investigations made by the Commercial Survey Department of the CHILTON COMPANY, it is estimated that there is an annual replacement market in the commercial car field for 135,000 batteries. This figure does not include the batteries now in use for lighting equipment exclusively, which is added by the owner as extra equipment, and upon which it is difficult and hardly practical to obtain accurate figures.

The interesting fact which the foregoing shows is that the battery type of ignition has made appreciable headway in the truck field. This is due to the increased pro-

	1920 Production	1922 Production	Total In Use
Battery-Equipped Commercial Cars.....	70,600	61,000	255,000
Magneto-Equipped Commercial Cars.....	251,400*	179,000†	845,000‡

* 101,400, excluding Fords. † 89,000, excluding Fords. ‡ 375,000, excluding Fords.

From this table it will be seen that approximately one-quarter of the trucks in use are using battery equipment. In 1920 the percentage of battery-equipped commercial cars was 28 per cent of the total production, whereas, in 1922 the percentage will run 34 per cent battery-equipped commercial cars, which shows that the percentage of battery-equipped cars is gradually increasing.

duction of light vehicles during the past eighteen months. It is estimated that the light delivery type vehicle will run about 70 per cent of the total truck production this year.

The point we wish to impress upon our readers is that the battery system is not on the wane as many imagine. The large capacity truck does not as a rule use a battery ignition system and because of this

many have come to the conclusion that the battery system is losing ground.

However, when we figure the great increase of light delivery vehicles in daily operation it does not necessitate a lot of figuring to conceive the replacement market which this field offers. It is a market which the battery manufacturer can well afford to cultivate more thoroughly.

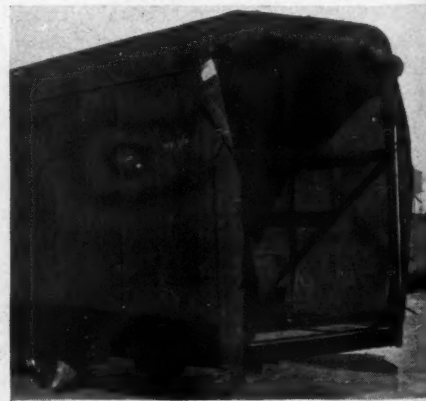
Trexler Company of America Increases Capitalization

The Trexler Company of America, maker of various "Trex" automobile accessories, Philadelphia, has increased its capital stock from \$200,000 to \$1,500,000, underwritten by George A. Huhn & Son, members of the New York Stock Exchange.

The Company has acquired a fine plant near Wilmington, Delaware, completely equipped for the manufacture of automotive products, with over 125,000 sq. ft. of space, three railroad sidings, and 27½ acres of land.

The following officers were elected at the recent annual meeting: President, H. J. Adair; vice-president, E. J. Flannery; vice-president and director of sales, Walter P. Coghlan; vice-president in charge of manufacturing, W. G. Penfield; secretary, E. J. Flannery; treasurer, Edward S. Perot, Jr.

Several new automobile accessories have been approved by the Engineering Department of the company and will be added to the line of the Trex products. Marketing plans for the coming year have been carefully formulated by Mr. Coghlan, who assumed his duties as director of sales recently.



Showing How the Transportation of Freshly Varnished Bodies Are Protected Against the Ravages of Dust and Dirt

This transportation unit, employed by the Studebaker Corp., consists of a GMC tractor and a special Detroit trailer. Dust curtains keep road and other foreign matter from gathering on freshly varnished jobs. The curtains are attached to a skeleton frame and, as may be noted, the bodies being transported are carried on a frame and not on the floor. On its 180-mile trip from Detroit to South Bend, which it accomplishes in 17½ hrs., this outfit carries 5 Big-6 Studebaker chassis and on its return trip brings back 24 finished touring bodies. This outfit, rated at 6 tons, has a capacity of 3672 cu. ft. It is 43 ft. long, 8 ft. wide, and 12 ft. 6 in. high. The maximum width of the pressed steel, gusset-plate reinforced frame is 36 in. The springs are underslung.

What One Man Thinks of the Body Business

Sees Need for Closer Co-operation Between Body Manufacturer and Truck Dealer. Discounts Not Adequate. Truck Dealer Can Increase Truck Sales if Body End is Handled Properly

By AN OLD-TIMER

A TRUCK body is of no earthly use without a chassis, and a chassis is not much better off without a body. Yet after the chassis has been sold and the dealer gets down to business on the body he is confronted with a situation that makes the deal hard to close up right at a time when conditions should be the most favorable.

In plain words, the motor truck dealers are not making the profits they should on bodies.

Body builders are running wild in their practices—they are competing against their very best customers, namely, the motor truck dealers. I shall grant there are some who are exempt from this indictment, but they are in bad company, and we must refer to the general run of body makers, even although the righteous may suffer with the guilty.

The rule with but few exceptions is that body builders, especially the smaller ones, are prone to quote individual buyers as low a price on special truck bodies as the dealer and when they do quote discounts to dealers they are so short that there is no profit in the deal.

True, the local body builder fills a gap left open by the truck maker and does a real service to the dealers, but at the present time—and it has always been so more or less—he is making it hard for the dealer to close a sale where the buyer needs a type of body not standard in the truck maker's catalog.

How Shall We Tackle This?

If you want to know what I mean, send to five body makers for a price on a sixteen passenger bus body and you will observe quickly that the body business is in a stampede, that there is no uniformity in the methods of merchandising and that it's a dog-eat-dog proposition. Bodies as similar as two articles made in different plants can be, may carry a very similar net price to the dealers, but the list price and the discounts vary a great many per cent and a great many dollars.

I tried it. One firm quoted me \$1200 less 25 per cent, while another who built a body so close in resemblance that they looked as though they both might have been built in the same plant asked \$900 less 10 per cent.

Both sent me some very well written literature that carried a strong appeal, but what position would a dealer have?

been in had his customers sent to the factories for catalogs?

This is not the old, old story about discounts and profits; it's a different problem altogether, because the sale of the truck and the body go hand in hand, but what position would a dealer have but under two entirely different conditions.

Motor truck dealers don't have to run on a highly illuminated cost system to know that they cannot sell goods on ten per cent profit. Retail salesmen working for these dealers can't display a great deal of enthusiasm when after making the deal, sometimes spending as much time satisfying the customer on the body as the chassis, they are told that there was no profit in the body and that there would be no commission on the same.

Why Gratuitous Body Sales?

Five years ago it would have been well enough to say that the body helped sell the truck, but the day is here when if there is no profit there is a loss—there is no middle ground in this age of high cost of doing business. And is there any reason why automobile dealers should act as agents for body builders without compensation equal to truck discounts?

Let's analyze a typical case. Suppose the truck chassis lists at \$1200 and carries 25 per cent discount at the factory, making the net price \$900. Now add the net price of the bus body, \$900, and the total is \$1800.

The customer naturally selected the \$1000 body, so you add this to the truck list and the finished job must sell for \$2200. The customer, we assume, will pay the freight and tax as a separate item. The gross profit on the transaction was \$400, which amounts to the same as 18 per cent discount instead of 25 per cent.

Yet the same dealer would not accept 18 per cent discount from the truck builder on one of the standard factory bodies. But what can the truck dealer do about it?

The truck maker claims he cannot carry bodies for every line of business, because it makes every job a special one, which increases the cost of production. Most of them are doing all that can reasonably be expected; they have boiled their line down to some good point of standardization and are leaving all other styles to the dealers and body makers to work up.

One producer of a light truck tells the writer that for years from 25 per cent to 35 per cent of their trucks are shipped out without any bodies and that during the winter months when their dealers are stocking up for spring and don't know just what is best to order they ship as high as 50 per cent chassis. And this is the face of the fact that the factory can supply nearly twenty types.

A maker of a line of heavier trucks says they usually ship a cab with every chassis, but outside of that fully 90 per cent of their trucks go out without any body. The Ford Company, it is understood, sells no truck bodies whatever.

Barring Ford, a fair estimation of the number of truck bodies not sold by the truck makers is 60 per cent. Including Ford, this figure is easily increased to 80 per cent. This is not far off.

Think of it! What do those figures mean?

I asked three Ford dealers what per cent the value of the body was of the complete truck, and their answers averaged 18 per cent. The same question was put to three Reo dealers and the replies ranged from 25 per cent to 33 per cent. One dealer who had sold a great many buses that cost as much as the chassis or more said that in his case it would run close to 50 per cent. In the case of a certain line of trucks from 2½ ton up, the figure dropped back to around 20 per cent.

Isn't It the Truth!

This means that millions of dollars worth of bodies are being sold this year on a hit-and-miss plan; and they are being built by everybody and anybody from ye old village blacksmith to the fruit crate makers—from has-been buggy makers to munitions manufacturers who sought to protect their investment after the war and keep their plants running.

When in doubt, built truck bodies seems to have become the shibboleth of all who were forced to turn their attention to new fields. The ranks of the body builders is the roll call of failures in nearly every other line. Is it any wonder that there is no uniformity in discounts—no standards of construction—no common ground of merchandising?

These are cruel words, but they are not meant for those who declared themselves to be on the other side and have proven their right to exemption from this indictment.

(Continued on page 72)

Getting the Truck Owner to Live Up to the Law

This Dealer Showed the Truck Owner That It Was Cheaper to Install Proper Lighting Equipment on His Truck Than to Pay Fines

By C. P. SHATTUCK



Service Station of Edward A. Higney, New Haven, Conn.

The proprietor has a chain of garages, repair shops, etc., selling his equipment and making a success of it, too

IN previous articles the writer has urged truck dealers to merchandise equipment and supplies, pointing out that not only was this a lucrative field, but that the dealer's best interests as well as those of his customers would be served by the service rendered. While it is true that the owner of the truck does not cover it with various devices or confines his purchases to equipment which spells cheaper transportation and convenience to operation, it is also true that many truck owners have not been properly presented with facts about truck equipment.

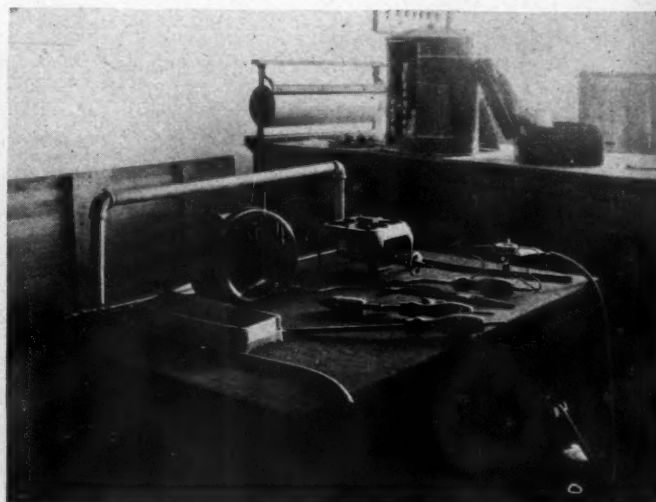
Won't Come and Get It

The truck owner is less likely to demand an item of equipment than the passenger car owner, for the simple reason that passenger car equipment is, as a rule, well advertised. The passenger car owner also sees certain equipment on his friend's car and becomes interested. But the truck owner rarely studies the equipment on trucks. Passenger car dealers display seasonal equipment and circularize their clientele. How many truck dealers make an intensive effort to exploit truck equipment? A few may, but the vast majority do not. It is true they stock equipment and that their salesmen try to sell, but the point involved is the efforts are not concentrated along the right line. The truck owner is not shown the investment or the legal side.

There are two methods by which the truck owner can be approached. One is from the investment viewpoint, showing him that the use of certain devices will decrease transportation costs and increase deliveries. The second is the legal factor. This is mentioned last because informing the prospect that he will be penalized unless he buys your device is too much of the big stick idea. A combination of both methods, using diplomacy insofar as reference to the law is concerned, appears to get better results, as will be later explained.

Taking a leaf from the books of successful dealers in passenger car equipment, we find that the successful salesmen are those who can demonstrate to the prospect that the device will either save effort, time or money. This is, the writer believes, the short route to the truck

A Demonstrating Stand With Which the Prospect is Shown the Utility of Various Appliances, Such as Soldering Iron, Stoves, Etc.



owner's pocketbook. If the salesman can show that the article effects a saving in money, time, etc., he has the prospect interested and closing should be fairly easy.

Law Requirements an Aid in Selling

Now as to combining the investment with the legal. We have in the majority of states motor vehicle laws which plainly state what the truck must be equipped with when operating on the highways. For example: Many states require a mirror and front lamps and tail light of specified illuminating abilities. This is the law, but in a number of places it has not been enforced. In some states it is. Because the officials are lax the average truck owner takes a chance. If you doubt this check the trucks you meet on the highways and note the number without mirrors and without proper lights. During motor trips in seven states the writer kept a rough check and was surprised to find that over 50 per cent of the trucks were not complying with the laws.

In one state it was found that trucks operating out of a certain city, and in towns within a radius of 25 miles were, as a rule, complying with the law. This was not due to the owners, but rather to the sales effort of a certain dealer. And the singular feature is that this dealer is not a truck dealer, but he has the garages and repair shops working for him. In other words this dealer is getting business, as are the shops, that rightfully belongs to the truck dealers in the territory.

In April of this year there arrived in New Haven, Conn., a young man from the western part of Massachusetts. This young man opened a service station to

merchandise Prest-O-Lite batteries, tanks and appliances. Fuel, oil, spark plugs, etc., are also sold. Now being a live wire, this young man first analyzed his territory and the laws of the state. He found, as will any dealer, that the greater number of trucks were winking at the law; did not have proper lighting equipment.

His next step was to visit every garage, repair shop and independent service station in his territory and sell them the idea that they could make money if they would keep their eyes and ears open by checking up the trucks not properly equipped with lights. The law was explained as well as the investment angle early referred to in this story. What the young man did was to make salesmen of the employes of the shops. They were taught to note the trucks not equipped as well as those whose equipment was damaged, etc. The result was that a whale of a prospect list was obtained, for there was an incentive in the shape of a nice commission. And when the shop can make money without much effort sales are assured of the product.

Builds Big Sales Force

The sales plan was carried to the outlying districts and put into operation with success. The booster for the service could either repair or install or send it to the main service station. Either way he was given a good discount. Effort was successfully made to educate the shops, to inspect lighting equipment and to sell new lamps, new burners, connections, etc. The young man referred to co-operated with his hosts of dealers with printed matter, etc. Now the point is that what this young man and his dealers did could have and should have been done by the truck dealers, because in the first place the owners are customers and it is a poor business policy to allow a customer to go elsewhere for service.

If these shops were successful in selling lighting service is it not reasonable to assume that they might be able to interest the prospect in other necessary equipment and in repair work? Criticism has been directed towards the independent shops, but if the truck dealers had been awake and on their jobs, i. e., serviced their customers, the outside shops would not be so numerous.

This young man had quadrupled his sales since April and has sold a large number of gas appliances. To introduce lighting and the uses of gas he staged a Prest-O-Lite week. Cards 14 x 20 in. were prepared in two colors, announcing evening demonstrations and these placed

in garages, repair shops, stores, etc. The demonstrations were well attended and, of course, included proper lighting equipment. Costs were talked on lighting, how deliveries were facilitated by good lights and the service features emphasized. One of the appliances that appealed to truck drivers who make long runs was a pocket type of stove using gas. With it the crew could quickly heat coffee or other liquids or food. A number of these were sold as a result of the week. One of the reasons for the week was to introduce the service of the station which is a model one. The result was a large number of sales and a big list of prospects.

Owner Won't Come and Get It

The success of this dealer proves that truck equipment can be sold if one goes after the business. **The owner will not come and get it.** The average truck owner is a business man, too busy to go seeking for devices, so the dealer must go after the business in a business way. Now

the writer has no doubt whatsoever if the young man with whom this article deals decided to stock heaters, priming devices, chains, winter cabs, anti-freezing solutions and other equipment which the truck requires, he and his associate dealers would be as successful as they have in merchandising lighting equipment.

It is a singular thing that when really successful merchandisers of truck equipment are located they are, as a rule, concerns not selling trucks. A few dealers are waking up to the fact that it is essential to sell equipment, if not alone for the profit derived, and it is not small by any means, but for the contact selling equipment makes and maintains with the owner. The potentiality of the market can be easily determined by any truck dealer. Just keep your eyes and ears open. Check the equipment of all trucks you see. Not only the make you sell, but the other fellow's. If you sell a device to the owner of the other fellow's truck don't you get in on the inside?

Reeves Says Country Can Use Three Million Motor Trucks

IN commenting on the census report of the Department of Commerce relating to all automobile manufacturing in 1921, Alfred Reeves, general manager of the N. A. C. C., supplied figures which show what an extraordinary record the automobile industry is making this year over the production figures of 1921.

"The official census figures, showing a decrease in automobile production for 1921 of 15 per cent in number and 23 per cent in value as against 1919 with the record production of the present time proves the wisdom of the manufacturers in promptly lowering prices of their products to the public, in many cases going below pre-war figures. Motor transport for persons and merchandise was needed and makers lowered prices to meet the reduced purchasing power of the country.

"Substantial losses were taken by every manufacturer, but the lowered prices, with many cars furnishing more and better equipment, brought the public into the market so that this year will be the greatest in the history of the industry.

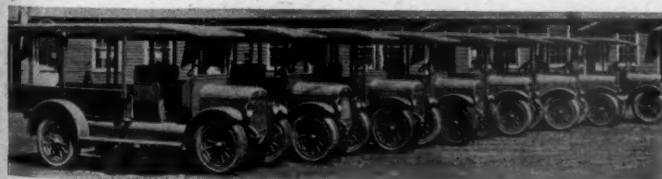
"For the first eight months we made 1,667,052 automobiles, which is 80,000 in excess of the full year of 1921. Of this, 159,553 were trucks. The best year on

record was 1920, when we produced 2,205,197 motor vehicles, a figure that will be substantially exceeded this year when production will be more than 2,400,000. This presents a return to the automobile industry of prosperity which will be reflected in industries like steel, copper, rubber, leather, aluminum and paint. All this, too, with exports only about 5 per cent, although constantly increasing, with a certainty that eventually 20 to 25 per cent of our production will go out of the United States. In 1920 our export of automotive products totaled \$320,000,000, going to 114 different countries.

"With 10,500,000 motor vehicles registered on January 1st, it is evident that this country can use at least 15,000,000 motor vehicles, of which 3,000,000 probably will be trucks. This insures a renewal demand alone of from two million to two and a half million power-driven vehicles per year.

"Gasoline, rubber and everything needed by the motorist are in ample supply and at constantly reduced prices.

"The automobile industry, the largest in the country, continues to make remarkable progress, in its aim to put the world on wheels."



Who Said That Business Was on the Decline? These Illustrations Show Two Fleets of Ruggles Trucks Recently Sold the Government for Use at the Brooklyn Navy Yard

One fleet consists of eight canopy top express body trucks and the other six oil tank trucks. The cabs are open and all-weather, respectively. They are all Model 20 chassis, rated at 1 1/4 ton capacity

The Re-Birth of the Electric Truck Industry

The Electric Truck Industry is Planning a Campaign to Obtain That Portion of the Highway Transportation Business to Which Its Product is Eminently Fitted. Sees Advantage of High-Grade Dealer Organization

ANYONE examining the year and handbooks of the automotive industry, especially with reference to motor trucks, will find little if any data on electric trucks. The same applies to production statistics. Since 1904 when the output was estimated at 411 trucks, up to and including 1921 when the production was 154,550 (the 1922 production is estimated at 225,000) no reference is made to electric trucks, relative to production or otherwise. And yet the electric truck apparently got away with as good a start as the gasoline truck. It is apparent, however, to use a sporting expression that in the race for production the "electrics have been left at the post." This is not meant as a reflection upon the electric unit but rather to point the way for a review of the reasons why the electric vehicle industry has not progressed in proportion to its opportunities.

Factors Making for Success

It is estimated at the close of the present year the truck industry will have produced nearly 1,800,000 trucks in 19 years. To accomplish this feat involved millions of dollars of investment; sales and service requiring engineering talent to produce designs which meet economical transportation requirements; an intensive and national wide advertising campaign to educate the public to the economy and utility of the product; clean-cut sales and service policies; and last and the most important of all the building of a dealer organization to distribute the product. These are factors making for success and large volume of business.

The truck industry has been successful because it has been aggressive in its policies and has not relied upon others to carry its message to the public. Each manufacturer constructed a design he thought best met the requirements of the field. He planned to exploit and pushed the sale aggressively. His advertising, sales and service messages have been and are built around his product, not the industry, although the manufacturer has always been, and is, a booster for his industry. Success has been his because of these policies.

But for many years in the past the electric industry has been dormant. Occasionally flashes of activity could be noted in the transportation field but these were not lasting or enduring despite the fact that the opportunities were most bright. In the matter of design it is held by those who have been in close touch with the electric truck industry that improvement in design, i.e., sturdier components, lower center of gravity, accessibility of units,

better motors, etc., was not given that attention by designers that it should have been. In other words, the same progress was not made as in the gasoline truck industry.

Another influential factor which retarded progress was that the prospect buying a chassis was confronted with the solicitation and purchase of a battery, next the charging outfit and last the body. In other words, the prospect had to be sold four times to obtain a transportation unit. Besides this the four groups, chassis, battery, charging and body groups were not co-ordinating to that extent essential to the success of the vehicle.

It is also said by the same authority that lack of authority of standardization had its influence in promoting the welfare of the industry, i.e., the service angle. In the days past there was not a battery service station on every corner and batteries were not as perfected as they are today. Then again the tendency of the chassis to obtain support from the Central Service station (current producers), battery charging equipment and perhaps, body makers when mapping out educational campaigns has not been successful. Neither, it is said, did co-operative campaigns give the results desired.

What handicapped the electric industry the most, however, has been its failure to adopt well-planned and aggressive sales campaigns, backing the same with intensive educational and dealer advertising and a realization of the importance of the dealer and the need of developing and helping him. In the matter of cost analysis and the requirements of special fields it is also held that the industry has been lacking. All of which is now a matter of record.

Now Conditions Are Entirely Different

The writer is advised by one in close touch with the electric industry that it is to wage an aggressive campaign to obtain its share of business in the transportation field. Compared with the days referred to, the electric truck has been vastly improved. Attention has been given to providing large factors of safety, lower center of gravity, better motors, more durable units and accessibility and simplicity of parts. A higher rate of speed and greater mileage per charge, due to battery improvements, is now obtainable. Instead of concentrating on one or two models, the average manufacturer has a complete line, from a 1000-lb chassis to 5-ton. This affords the dealer an opportunity to meet all transportation requirements of the prospect.

Standardization has progressed and today well-known units such as Timken and

Sheldon axles, Mather, Spring Perch and Sheldon springs are used, and standard steering gears such as Ross, Gemmer, Lavine and Wohlrab. The same applies to controllers. Consequently replacements and service is facilitated as the sources of supply are ample.

The progressive manufacturers are making an intensive analysis of special fields and are giving close attention to the requirements of the chassis and bodies so that more economical transportation, ton-mile or package delivery may be obtained by the prospect.

Well-planned, aggressive sales and educational campaigns are being evolved to exploit those fields to which the electric industry considers its product best adapted. These campaigns should make further intrenchments in the horse field for the electric makers have cost data which will oust old Dobbin from what has heretofore been considered a seemingly impregnable position. Certain electric truck manufacturers are developing high-grade transportation engineers and specialty salesmen; men who can compile accurate costs and present them with a pocketbook appeal. The electric industry realizes that transportation costs are a big factor in sales today and will be even more so in the future.

Opportunity for the Wide-Awake Dealer

But the greatest stride towards success yet made by the industry is its realization of the importance of the dealer, of the need of developing the right kind and of giving him the assistance he should receive from the factory in transportation analysis, exploiting the product nationally and in the home field.

There is evidence of building a better contact between the dealer and the factory, and one manufacturer said that since starting his dealer campaign in a trade medium that the number of prospective dealers visiting his plant is remarkable.

Furthermore, the electric manufacturers are evolving more liberal dealer policies, eliminating those clauses and factors which have not brought about co-operative and harmonic spirit between the maker and seller.

From this it will be deducted that the electric truck industry has decided that there is a market for its product and that by aggressive, well-planned sales policies, plus educational campaigns, and a real dealer organization, that it can still further push old Dobbin to the background as well as obtain its share of business in the transportation field. It is very evident, therefore, that future year and handbooks will contain references to the electric truck

What Does the Prospect Really Want to Know?

Avoid That Want and You Will Lose. Satisfy It and You Will Gain Both His Confidence and Business

The New Order of Truck Merchandising Demands It

By F. H. SWEET

AT one time the sale of automotive equipment was considered merely from the pleasure standpoint, but that time has passed on. The idea has gradually developed that the motor car satisfies a want which is not prompted purely by pleasure, and that consumers do not necessarily waste their money in pleasure-seeking when they purchase a car. This change of attitude was accelerated by the emergence of the motor truck, and later the tractor. At the same time the belief that the dealer in automotive equipment should be classed with vendors of articles to be used for immediate consumption rather than a vendor building for future production has been so modified that the dealer is now to be regarded as a transportation merchant. His task is to sell equipment for transportation ranking second only to the railway and steamboat.

The dealer, therefore, who plans his business in such a way that he may be able to supply the needs of proper transportation will be the most successful in the long run, because he will be able to satisfy the individual requirements of his customers. Sometimes it may be necessary to concentrate on the sale of motor trucks, and at other times on the sale of passenger cars; but generally speaking, a complete line of motor equipment will be the most apt to develop rapidly. And as this development takes place, the keen, wide-awake dealer will also enlarge the scope of his efforts. It would be better, therefore, that the idea of a mere automobile dealer be supplanted by the broader idea that the dealer exists as an expert whose task is to sell automotive equipment which will entirely satisfy the customer after the latter has given it at least several months' trial.

One Cause of Neglect

The most successful distributors are those who, while they may sell motor trucks and passenger cars together, have specialized in the two fields. As trucks were of secondary importance in distributors' eyes during the growth of the automobile industry, this branch of the business is one in which the distributors of both cars and trucks have had the least experience and acquired the least knowledge. With this condition existing among the dealers it is little wonder that the

distributors sold, and that uninformed buyers bought sizes of trucks and equipment of a character unsuitable for their use. When a customer comes in a dealer's show rooms and asks to be shown some trucks, almost invariably the salesman will ask him at once, "What size do you require?" The customer knows very little about trucks, and his answer to the salesman's question is very apt to be wrong. Accordingly the salesman proceeds to sell him the wrong equipment. On the other hand, if the salesman would ask: "What hauling do you want done by the truck?" and if he would then proceed to analyze the buyer's requirements, something very different might have been sold, such as a one-ton truck in place of a two-ton, or a five-ton truck instead of a three-ton truck.

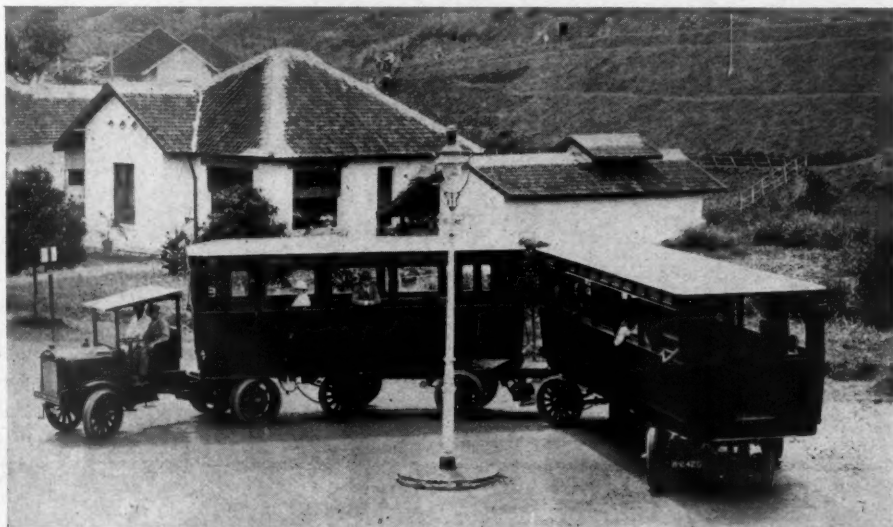
Managed by a Specialist

The truck department of every distributor's business should be managed by a specialist in truck transportation. Even the small distributor should employ one or two salesmen who have a good grasp of the problem. They should have a

thorough knowledge, acquired in some practical way, of moving most economically tonnage of all descriptions under varied conditions, and they should advise a buyer what to buy in order to satisfy his requirements. Distributors employing salesmen who do not have this knowledge are under a severe handicap in competition with others employing salesmen who might correctly be called "transportation experts."

Study the Prospect's Requirements

As an example of the importance of knowing the conditions under which equipment is to be used, the following little story is related of an incident that put thirty-one 36 x 6 and 38 x 7 pneumatic cord truck tires out of commission in two months. A large firm in the dairy business sent five 1½ ton trucks, equipped with pneumatic cord tires, to a dairy section for use in hauling milk from farms to their condensary. This transportation service induced the farmers to increase the production of milk, and trucks that morning and night usually carried forty 10-gallon cans only three-



How the Trailer Principle is Utilized on the Island of Java in the East Indies

The trailer material and devices used in these trains for making sharp right angle turns are the product of the Martin Rocking Fifth Wheel Co., Springfield, Mass. The company operating these passenger vehicles also operates 20-ton freight trains. Because of the reduced weight over one axle this system of transportation is claimed to save enormous wear and tear on the highways.

quarters full, were soon carrying double-deck loads of sixty 10-gallon cans quite full. Each full can weighed 127 pounds—a total of 7,620 pounds (70 per cent on the rear), or, plus the weight, $4\frac{1}{2}$ tons. This meant an overload of 1,500 pounds per tire. It was the custom on the part of the drivers to "step" on the accelerator when a good stretch of road was before them.

Very soon one driver had a blowout and he had to telephone for a new tire. This caused the others to look at their tires, and they found that the tires were chewed, and the rubber torn off in many places. It was maintained that the air pressure had been all right. Hadn't the air been heard to sizz through the line? Hadn't each tire been kicked, and hadn't each driver sprung up and down on the hubs to test each tire? Of course he had.

A dozen new spares went on. Business was still good and heavy loads were still the order of the day and night. Tires were still being tested in the same crude way and drivers resorted to speeding whenever they felt like it.

It took the new spares just about as long to go to pieces as the original equipment. Thereupon, interested parties made an investigation of the circumstances which led up to this situation, and this was found:

- 1.—Roads were good.
- 2.—Loads of as high as $3\frac{1}{2}$ tons were being carried on $1\frac{1}{2}$ ton trucks.
- 3.—Drivers were without pressure gages—lost or mislaid them.
- 4.—Spares on demountable rims were kept in the garage but not carried on trucks.
 - (a)—The value of the demountable rims was being wasted.
 - (b)—Time was being lost in waiting for another car or truck to bring spares.
 - (c)—Tires were being run flat.
- 5.—There were no facilities for repairs of any kind. No tire putty or cord patches were being carried in stock.
- 6.—Valve caps and dust caps were absent in most cases and valve centers were being exposed to mud and moisture with resultant slow leaks.
- 7.—Pressure in the air tank would only amount to 90 lb. The pressure in the tires average 85 lb.

8.—No analysis of work to be done or loads to be carried or roads to be traversed or service facilities had been made by either the truck agent or the dealer who sold the tires. In the end it resulted in a loss.

First, a dealer must be prepared to service the trucks he has sold by carrying an adequate supply of parts in his stock room and by supplying free air with high enough pressure for pneumatic truck tires. So far as a supply of parts is concerned, truck users justly demand better service than do passenger car owners because a truck laid up for a part which is not in stock means a financial loss to the owner. Free air with high enough pressure to inflate properly pneumatic truck tires is a pressing need throughout the country. The air tank for inflating automobile tires is not usually strong enough to inflate truck tires to the proper standard of pressure, and when air is insufficient the tire is put to a strain which eventually causes trouble. The dealer should regard the question of air with a sincere respect for the influence it has on his business future.

Secondly, the truck distributor requires ample capital or banking connections to finance time payments. Many trucks can be sold to good reliable concerns providing the payments can be carried over a period, which period incidentally should not exceed one year. It is obviously im-

possible for any dealer to tie up his capital in this manner, and he must arrange for sufficient backing with some financial institution if he is to enjoy the profits which would accrue on time sales.

This suggests the third point, that the financial position of both customers and prospective customers should be given very careful study if the distributor is doing business on a credit basis. Mercantile reports on all active prospects should be obtained because they will show you who really controls the prospect's business, whether the size of the concern justifies the purchase of expensive equipment for cash or credit, and whether its financial capacity is sufficient to assume the obligation when the truck is sold. The concern may be perfectly willing to buy, but it may be nearly insolvent. Consequently a sale or attempt to sell in such case would be a waste of time and effort, and might involve a loss of money. In a year like this, we may have many more failures than in a normal year, and even in a normal year there is a large percentage of failures. So the dealer should be advised to make sure that he is going to receive payment for them, sooner or later.

Knowledge of truck transportation, financing time payments, the customer's requirements, and finally his ability to meet his obligations will make the sale of trucks a more profitable business.

Deckard-Mitchell Absorbs the Cleveland Precision Tool

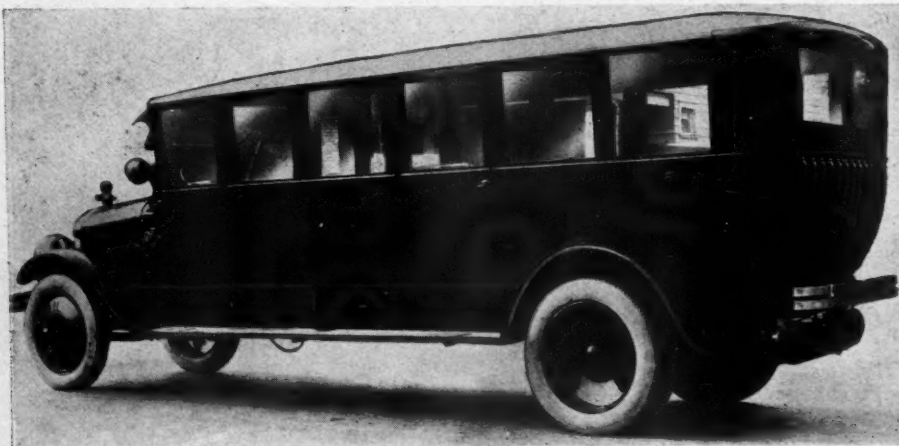
The Deckard-Mitchell Engineering Co., which was organized last summer, to manufacture special production machinery and tools, has taken over the plant and equipment formerly owned by the Cleveland Precision Tool Co., and is producing special equipment and tools for several prominent motor vehicle manufacturers.

The company is already making extensive plans for expansion to take care of the increased volume of business that has been offered it. A very complete designing and engineering department is being maintained for the service of customers.

Snow Removal Under Consideration of Government

Surplus war equipment may form the solution to the snow removal problems of the various highways of the country, according to plans now under consideration by the Bureau of Public Roads of the Department of Agriculture. According to the laws governing the disposal of the Federal-aid funds for road building, none of these funds can be used for state road maintenance—after the road is built, the state must keep it up or forfeit all highway Federal-aid.

It is thought that by presenting the various state highway commissions with war material, such as grading plows, tractors and other equipment that could be used in snow removal, the work of keeping the highways clear during the winter months can be successfully conducted.



Pullman Accommodations Are No Longer Confined to Tracks

The above is a view of the new Mack Limousine Bus which negotiates with clock-like regularity between Youngstown and Warren, Ohio. This bus covers twenty miles of highway on each trip, providing passengers with pullman riding comfort

Firestone Rubber Will Show Nice Profit

Advance estimates of net profits for the fiscal year ending October 31, for the Firestone Tire & Rubber Co., Akron, O., promises to reach nearly \$8,000,000. For the first eight months of 1922 net profits were \$5,000,000.

High record for daily production of tires was 28,000, later dropping to 26,000, where it remained. In view of the increased business which will most likely result from the Ford reduction, one of the Firestone plants may have to be operated at capacity to meet the demand for Ford equipment.

Are You Making a Profit on the Trade-in?

Most Dealers Are Not, But the Reason for This is Apparent. Have the Dealers in Your Town Ever Given the Appraisal Bureau a Real Try-out?

By C. S. PERRIE

WHENEVER the dealer finds that his investment in used trucks attains proportions which threaten to pull down his financial structure, he will listen to another dealer or dealers when they suggest taking some steps to stop "this wild trading." Very likely several interested dealers will meet at lunch and discuss the advisability of holding a meeting to see if something cannot be done to better conditions.

Now if you were a rank outsider listening to the discussion and did not know the truck industry, you would come to the conclusion that there must be enormous profits in selling trucks for you would hear the dealers exclaim in no uncertain tones that the Brown, Pink, Yellow and Blue truck dealers allowed \$1000, \$1500, etc., above what the "trade-in" was worth. And if you listened carefully you would hear at least one dealer state that the Blue and Pink salesmen suggest to the prospect that he buy some old junk. Then he (the salesman) would make a handsome allowance for it. And again it might be heard that certain factories encouraged their representatives to make long discounts, indirectly or otherwise.

Now if the listener to these tales of woe, and they are more than that, ever becomes a prospect for a truck he will remember that the best way to purchase was to pick up some old junk and load it on some dealer. And that is what the shrewd buyer is doing today and will do tomorrow and the day after unless the truck industry as a whole wakes up to the fact the greater the allowances and the more of them, the sooner the whole works will blow up. And this will apply to the dealer and the factory as well. If the dealer goes wild in his trading he goes under and the factory's prestige suffers. And indirectly the factory suffers a financial loss, because during the time it takes to get another dealer in that city **trucks are not being sold and your competitors are making capital—at your expense!**

The dealer who blows up through wild trading or rotten service smears the product with a bad name. And the dealer who has the courage and capital to take on the line has a battle which will be a T-O-U-G-H one.

Is There a Remedy for the Wild Trade-in?

Whenever the subject is discussed among the dealers, sales managers and factory men, and after circling miles without landing, the conclusion is reached that the "trade-in problem is one that must be solved by each individual dealer." Thus

the buck is passed, but the industry is no nearer to a solution.

It is the belief of the writer who has sat in with committees appointed to solve the trade-in evil, and who has been present at many meetings on the same subject, that the 100 per cent remedy will never be developed because of the human equation. One of the largest cities in the country was, and still is to a certain extent, the king bee in the wild trade-in. Certain representatives of trucks were so liberal in allowances that the other dealers became alarmed. Salesmen were met with "offers" which they could not meet, at least their employers could not without going broke fast. So certain of the more progressive dealers got together at a luncheon and it was decided to call a meeting of all truck dealers and discuss measures to relieve conditions. They did not believe; in fact, knew that a cure was not practical.

Why They Don't Organize

The first meeting was well attended. The "sufferers" were present but those who were liberal in allowances were either absent or sent a clerk. In the latter case he was instructed to listen carefully, talk not but to bring back a report. Meeting after meeting was held. A few worked hard to prevail upon the others to attend. An appraisal plan was finally adopted and when ready to put into effect it was found that a number of the bigger interests would have nothing to do with it. The result was that the weak sisters threw up the sponge for they argued that unless all came in the plan wasn't worth a darn. Those who were on the fence said, Well, if the Blue, Pink, Yellow and Brown won't come in I guess we won't tie ourselves to a plan which will give them a walk over in sales." And so the entire works blew up. And in this city the prospect flourishes and the dealer does not. The dealer who has represented the same make of trucks for over three years are few and far between. Time changes and so do the dealers.

This big city is not an exception. In other places those dealers who realize the cumulative effect of excessive allowances have tried to organize, to combat the evil but the plan peters out as it did in the big city and for the same identical reasons. And efforts will always fail until the dealers realize that **any plan cannot be made 100 per cent in membership** and that they must organize and carry on **without the minority**. And minority is the proper word.

Can it be done? Yes, it can. The truck dealers will do well to emulate the passenger car dealers in the trade-in problem. If the truck dealer thinks he has a problem in the trade-in then the passenger car dealer has a couple dozen. The name for the problem is the used car but it all amounts to the same thing in the end—**How much will be paid for the trade-in?**

Appraisal Methods Only Solution

It is true that some dealer associations in some places have not made a success with their plans but others have in sufficient number to prove the contention that whenever a sufficient number of dealers agree to protect themselves, and the public as well, that it can be done. I recall attending a meeting of a dealer association in a fairly large city in the East. These dealers were trying to put over an appraisal plan, an agreement not to boost prices to the owner, but to make a reasonable and sane allowance for the car to be traded-in. It was some hot meeting largely because a few impetuous members did not thoroughly understand the plan but when they did they were sold. It appears that some of these dealers also handle trucks which is not uncommon. As section after section was read of the proposed agreement, and discussed, they reached the section dealing with truck allowances. No sooner had the chairman of the committee read the section than a flock of dealers were on their feet. What one said reflected the attitude of them all. "We are with you on the passenger cars, but leave out the trucks for in this city it is a dog-eat-dog proposition and we want no agreement which will dull our teeth." And the trucks were left out and the dogs are still fighting and failing in that place.

And this is the crux of the story. Just as long as dealers fear certain other dealers, who are not broad-minded enough to give at least their normal support to a movement which will stabilize truck selling; just as long as each dealer is willing to fight the other dealer in prices, just so long will the trade-in evil flourish. And dealers will continue to go to the wall and factory executives will continue to exclaim, "My Lord, what are the dealers coming to? Aren't there any real dealers to be had in these days?"

The remedy is for the worth-while dealers to organize an association for the protection of their interests. Such an organization will have its bumps before it iron out part of the wrinkles in the trade-in evil. It will take courage for the members to agree to make the shopping,

"trade-in hound" a present of a cool thousand dollars to avoid refusing an order. It will hurt to see those not in sympathy with the association gathering in orders. It will take time, and brains, to perfect a campaign to educate the buying public that something cannot be given for nothing, that either the outside dealer is asking too much in his list price or is gyping the buyer when it comes to service. Everyone with common sense, and experience in the industry knows that the discount the dealer receives in a sale is not all profit and that his overhead is more than rent and sales expense.

When an association is formed, the members must have confidence in each other and not listen to malicious tales—sly hints or suggestions as to what the other fellow does to get around the agree-

ment. The greater trouble with dealers is that they are too willing to listen to tales which are at the best but partly true. If the association does not cure the trade-in evil, at least, it will have accomplished much for it will bring the dealers together and if they will stick their feet under the round table and discuss their business they will find more time to perfect better selling conditions and forget petty jealousies. If the association cannot adopt some form of an appraisal plan, a binding one, it at least can appoint a committee to set a standard of prices which will help end some of the wild trading done through a lack of knowledge of the other fellow's product. If dealers would get together and know each other they would rob the shopper-trade-in hound of his punch, i. e., playing one dealer against another.

The factory should take some interest in aiding the dealer to become a better dealer. The dealer who trades wild for any reason will not become a better dealer or a stable dealer. He will be spoken of in the past tense. Excessive allowances may move trucks and more trucks than might be possible if they were sold at a profit. But whenever the dealer list is depleted do not sales cease with the dealer's demise?

The dealer is the keystone in the arch. And every keystone should be sufficiently sturdy to provide a big factor of safety. Allowing or winking at excessive trade-ins is crumbling the keystone. It is time repairs were begun and it is not entirely up to the dealer. His problems insofar as moving the product is concerned is also a factory problem.

The Huckster as a Motor Truck Prospect

By A. V. COMINGS

MOTOR truck dealers who are overlooking the possibility of selling light trucks to fruit and vegetable peddlers are missing sales that are right at their doors. Every city in the country has its quota of fruit and vegetable peddlers who go from door to door through the residential districts, usually over regular routes, disposing of their products to housewives who would rather buy from them than order from groceries or markets. Many of these peddlers still use the old time horse-drawn wagons, but the light motor truck has invaded this field and is rapidly relegating the old horse to the pasture or the boneyard.

Harry Riggs, manager of the truck sales department of the Capitol Motor Company, of Columbus, Ohio, has been exceptionally successful in selling motor trucks to this class of business, and today most of the vegetable hucksters in Columbus are covering their routes in handsomely built outfits mounted on Reo Speed Wagon chassis. The Capitol Company sells Reos and Pierce-Arrows in the Columbus territory.

The two big factors that put the motor truck ahead of the horse-drawn outfit in handling vegetable routes are speed and capacity.

The bodies used carry just twice as much produce as horse-drawn vehicles, enabling their owners to serve just twice as many families in a day, with practically

twice the profit they used to make in the old days.

The best the old horse could do on the huckster wagon was from 6 to 8 miles a day, whereas the trucks cover from 15 to 20 miles a day without effort, serving customers promptly and with the utmost satisfaction. The housewife along toward the end of the route, who used to have to wait until late in the afternoon to make her purchases, may now buy much earlier in the day, and anyone who knows women knows that they like to have their household buying over with before late afternoon. When the women customers learn that the truck will bring them their vegetables and fruit far earlier than the horse outfit, they become constant customers.

These motor hucksters cover regular routes every day. They go down to the

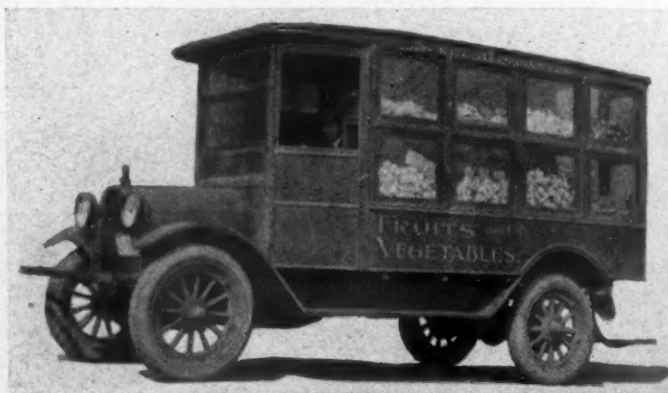
commission houses in the early morning hours and make their purchases of the commission merchants for the day's rounds. Then they drive to the first house on their routes, sometimes a considerable distance, and it is in this drive to the start of their route, and on the movements between houses, that the truck has another big advantage over the horse, saving one to two hours a day.

As all the trucks are fitted with electric starting motors, the engine is always stopped when a call is made, so that there is absolutely no expense going on when the rig is at rest. In the matter of housing the motor-driven truck, and its care, the comparison is all in favor of the truck as against the horse, as it requires less room and much less daily attention.

And don't forget that the housewife buying vegetables and fruit is much more apt to buy from a huckster who comes from a clean, well kept mechanical outfit than from the one who drives a scrubby old horse, whose cleaning and harnessing are his daily task before he starts delivering the produce on his route.

The upkeep of the truck in this sort of work is almost nothing. The low mileage, mostly over smooth city pavements, makes for long life of both

(Continued on page 51)



The New and the Old

The horse was too slow for Mangia so he bought himself a speed truck.





EDITORIALS



Need United Support

IF there is anything more disheartening to the officials of the average trade association than the lack of interest some of its members display when they are asked to do something to help along a certain cause, we would like to know it.

In every trade association, local or otherwise, there are some who do the bulk of the work. They spend their time and money for the benefit of the others who very seldom attend the association's meetings. Not only do they absent themselves, but usually they are the first ones to criticize the association's officials when something doesn't suit them. Under such conditions no association can function properly or make any decided progress.

We recognize the fact that the trade association cannot regulate prices or act contrary to the law, but it can act as a clearing house for information on current market values of used vehicles. It can, by interchange of ideas, stimulate its members to better business methods, it can do real constructive work which will eventually result in a better class of merchants.

The contention also seems to be in some of the larger cities that it is impossible to get certain ones to join, particularly some branch houses and that the latter will not lend their support to any movement relative to trading-in trucks at the market value. When such a condition exists then the only thing the dealers can do is to go it alone.

At any rate the dealers who stick to sensible trade-in values will at least not be the recipients of a lot of high-priced second-hand vehicles. The profits lost from a few sales, would be much less than the accumulative loss of a lot of second-hand trucks taken in at excessive prices.

There are many if's, and's and but's that can be brought up against the plan. The trouble in most cities is that the appraisal bureau or any other similar plan has not been given a fair trial. Those against any such a procedure usually put up the greatest opposition and the remainder simply take it for granted that the plan will not work. In a few cities the appraisal bureau is working out in great shape, why then can't more cities have such bureaus? It's simply because the dealers are not organized properly. This is a subject which demands the attention of every local dealer's association in the country. The dealers hold the situation in their hands and they alone can end it.

Tell It to Your Congressman

CONGRESS is now in adjournment, but it will convene again this winter. This may mean nothing to many dealers, but it will mean something to the wide-awake automotive dealer if he will stop and realize that the automotive industry is paying about \$100,000,000 in war excise taxes, in addition to all other taxes upon the sale of the industry's products.

In the 1922 revenue bill Congress saw fit to relieve the tax upon transportation. It repealed the tax upon **railroad** transportation—but "there was nothing doing" on motor trucks and passenger cars.

Why were the war excise taxes taken off the railroads and not automotive vehicles, parts, etc.?

Simply because the railroads had more influence. They gave Congress a whole lot of reasons why this tax was a burden to them. They knew that if enough pressure was brought to bear Congress would have to do something. Publicity in the dailies throughout the country indicated the financial burdens under which the railroads were staggering; it was shown that such taxes prevented the railroads from lowering freight and passenger rates, and so forth. They got what they were after.

Your congressman and senator must be shown why this tax is a burden to this industry, why it increases sales resistance, why it places a discriminatory tax upon one of the most essential commodities in the country, the motor truck and the passenger car. The war has been over for four years and the industry is still paying war taxes.

The N. A. C. C. and the N. A. D. A. have started the ball rolling. They are going to do all in their power to get these taxes repealed. But they can't do it alone. Every dealer and manufacturer can do his share, by simply writing a letter to his congressman and senator, giving him reasons why this tax should be repealed.

If you want to carry the good work a little further ask your customers to help. If you know some one in your town who knows Congressman So-and-so, get him to use his influence.

Arouse the interest of your local trade association in this matter. Get the your local newspaper to agitate the issue, and last, but not least, don't let this matter slip from your mind and figure "that George is going to do it."

Everybody in the industry must help.

News of the Trade in Brief

Production for September 20 Per Cent Ahead of October

Early Reports to N. A. C. C. Indicate Best Autumn Trade on Record. Truck Market Active

Production of motor vehicles running 20 per cent above September was reported to the Directors' meeting of the National Automobile Chamber of Commerce, in New York on November 1. The total output for the entire industry for October, based on statements of shipments, is estimated at 244,400 cars and trucks. The best previous October record was 200,000 in 1919.

Increased availability of coal, which was relatively scarce in September, largely account for the unusual October increase. The production of the latter month met a number of unfilled orders, as well as supplying October sales which were about 25 per cent under September in most sections of the country. The fall months,

though seasonably less than the summer, are expected to register the best autumn trade on record.

Six states: Massachusetts, Ohio, Maine, Colorado, New York and South Dakota, report improvement in the movement of used cars. Shortage in freight transportation is maintaining the truck market at the September level with Massachusetts, Texas, Pennsylvania and Ohio showing increases. Reports of the U. S. Department of Commerce record that motor truck production in September 1922 was 27 per cent above September 1921 though showing an expected decline from summer business. The output for September this year was 18,843, for August this year 24,200 and for September 1921, 13,648.

Station Wagons Are Not Trucks

A recent decision handed down by the Appellate Division, New York, holds that the common type of motor vehicle known as the station wagon or suburban is a passenger car and not a truck. This classification entitles this type of vehicle to the lower license rate collected by the Automobile Bureau.

Ford One-Ton Truck Has Been Reduced Fifty Dollars

Increased Volume of Business and Control of Raw Materials Stated to be Responsible for Reduction

A somewhat unexpected reduction in the price of all Fords, including the Ford truck was announced by the Ford Motor Co., October 17. No change was made in the tractor price. The new change places the truck at \$380 f.o.b. Detroit.

The present price is the lowest in the history of the company and is caused by the increased volume of business, and the control operation of the sources of raw material.

Other companies announcing price changes within the past few weeks are the Bethlehem Motors Corp., Bethlehem, Pa.; Nobel Motor Truck Corp., Kendallville, Ind.; Twin City Co., Minneapolis, Minn.; N. Y.; and the Southern Motor Mfg. Assn., Ltd., Houston, Texas.

SHOWS

- January 6 to 13, 1923—New York, N. Y.** Annual Automobile Show of the N. A. C. C., in Grand Central Palace. Passenger Cars and Accessories. S. A. Miles, Mgr., care of N. A. C. C., 46th St. and Madison Ave.
- January 8 to 13, 1923—New York, N. Y.** 2nd annual body builders' show at the 12th Regiment Armory, auspices of the Automobile Body Builders' Association.
- January 13 to 22, 1923—Oakland, Calif.** Fifth annual show, Motor Car Dealers' Division of Alameda County Auto Trade Assn., Civic Auditorium. Passenger cars, trucks, tractors and accessories. Robert W. Martland, Mgr., 47 Pacific Bldg.
- January 15 to 19, 1923—Chicago, Ill.** 14th National Good Roads Show, of American Road Builders' Association, Coliseum.
- January 27 to February 3, 1923—Chicago, Ill.** Annual Automobile Show of the N. A. C. C. in the Coliseum and 1st Regt. Armory. S. A. Miles, Mgr., care of N. A. C. C., 46th St. and Madison Ave., New York City.
- February 3 to 10, 1923—Troy, N. Y.** 9th annual automobile show, auspices of Troy Used Car Sales Corp., New State Armory (40,000 sq. ft.). Passenger cars, trucks, tractors and accessories. Frank M. Baucus, Mgr., 155 River St.
- February 3 to 10, 1923—Minneapolis, Minn.** 16th annual automobile show, auspices Minneapolis Automobile Trade Assn. Passenger cars, trucks, tractors, accessories. W. R. Wilmot, Mgr., 709 Andrus Bldg.
- February 5 to 10, 1923—Charlotte, N. C.** 3rd annual show of Charlotte Automotive Trade Assn., Carolinas Exposition Bldg. Passenger cars, trucks and accessories.
- February 12 to 19, 1923—Portland, Ore.** 14th annual show of Automobile Dealers' Association of Portland, Inc. Municipal Auditorium (36,000 sq. ft.). Passenger cars, trucks, tractors and accessories. Ralph J. Staehli, 424 Henry Bldg.
- February 16 to 26, 1923—San Bernardino, Calif.** Automobile exhibit in connection with 13th annual National Orange Show. Tent. Passenger cars, trucks, tractors, and accessories. R. H. Mack, Mgr., 215 Chamber of Commerce Bldg.
- February 17 to 24, 1923—St. Louis, Mo.** 16th annual show auspices of St. Louis Automobile Dealers' Assn. Passenger cars, trucks, and accessories. Robert E. Lee, Mgr., 3124 Locust St.
- February 17 to 24, 1923—Akron, Ohio.** 9th annual show of the Akron Automobile Exhibition Co., Central Garage (45,000 sq. ft.). Passenger cars, trucks, tractors, accessories. E. T. Jones, Mgr., 1091 W. Exchange.

Coming Events

- February 17 to 24, 1923—San Francisco, Cal.** 7th annual automobile show, San Francisco Motor Car Dealers' Association, Exposition Auditorium. Passenger cars, trucks, tractors and accessories. G. A. Wahlgreen, 215 Humboldt Bank Bldg.
- February 26 to March 3, 1923—Syracuse, N. Y.** 15th annual show at State Armory (43,000 sq. ft.). Passenger cars, trucks and accessories. Howard H. Smith, Mgr., 701 Eckel Bldg.
- March 10 to 17, 1923—Boston, Mass.** Annual show at the Mechanics' Bldg., auspices of Boston Automobile Dealers' Assn. Passenger cars, trucks and accessories. Chester I. Campbell, Mgr.
- March 10 to 17, 1923—Newark, N. J.** Annual automobile show of the Newark Auto Trade Assn. Claude E. Holgate, Mgr.

CONVENTIONS

- Chicago, Ill., January 15 to 19, 1923—13th American Good Roads Congress and 14th National Good Roads Show, American Road Builders' Association at Congress Hotel and the Coliseum.**
- Chicago, Ill., January 31, 1923—Meeting and dinner of the Society of Automotive Engineers, Congress Hotel.**
- Chicago, Ill., November 20 to 22, 1922—Fifteenth annual convention of Southern Commercial Congress, under auspices of Chicago Association of Commerce, and the Illinois Manufacturers' Association, Col. Winfield Jones, Secy.-Treas., Southern Bldg., Washington, D. C.**
- Corpus Christi, Texas, March, 1923—Annual convention of the Texas Automotive Dealers' Assn., W. A. Williamson, Mgr., 104 Gunter Hotel, San Antonio.**
- Davenport, Iowa, January, 1923—Meeting of the Midwest Regrinders' Association.**
- Grand Rapids, Mich., November 21, 1922—Joint sessions of the North Central Division of the National Highway Traffic Association and the Michigan State Good Roads Association, Ball Room, Hotel Pantland.**
- Grand Rapids, Mich., November 21 to 23, 1922—Annual meet of the Michigan State Good Roads Assn.**
- Great Falls, Mont., May, 1923—Annual meeting of the Montana Automobile Distributors' Association, Hotel Rainbow. L. E. Jones, Secy.**

- Harrisburg, Pa., November 20 to 21, 1922—Annual convention of the Pennsylvania Automotive Association. L. H. Hagerling, Secy., Harrisburg.**
- Indianapolis, Ind., December 5, 1922—Annual convention of the Indiana Automotive Trade Association. D. C. Barnett, Secy., 729 Peoples' Bank Bldg., Indianapolis.**
- New York, N. Y., January 9 to 12, 1923—Annual meeting of the Society of Automotive Engineers, Engineering Society Bldg., 29 West 39th St.**
- New York, N. Y., May 7 to 10, 1923—Annual convention of Chamber of Commerce of the United States.**
- Olympia, Wash., July, 1923—Annual convention of Washington Automotive Trade Association, Olympian Hotel.**
- Providence, R. I., April 5, 1923—Annual election of officers, Rhode Island Automobile Dealers' Assn. Ralph P. Lord, Secy., 617 Industrial Trust Bldg., Providence.**
- Quincy, Ill., March 3, 1923—Fourth annual convention of the Illinois Automotive Trade Assn., F. C. Zillman, Mgr., 212 Lehmann Bldg., Peoria, Ill.**
- Richmond, Va., March 8, 1923—Annual convention of Virginia Automobile Dealers' Assn., Murphy Hotel.**
- St. Louis, Mo., December 6 to 8, 1922—Third annual meeting of American Petroleum Institute at Statler Hotel.**
- Salt Lake City, Utah, February, 1923—Annual meeting of Intermountain Automotive Trades Association, Carl L. Snow, Mgr., Salt Lake City.**
- Toledo, Ohio, December 6 to 8, 1922—Sixth annual convention Ohio Automotive Trade Association, at La Salle-Koch Co., assembly rooms. E. J. Shover, Mgr., 404 Central National Bank Bldg.**
- Topeka, Kansas, January 15, 1923—Convention of Automobile Trade Association of Kansas. Phil. E. Zimmerman, Topeka.**

FOREIGN EVENTS

- Brussels, Belgium, November 10 to December 19, 1922—Automobile Show, Palais de la Cinquantenaire.**
- Brussels, Belgium, January 13 to 24, 1923—16th annual Automobile and Cycle Exposition at Palais du Cinquantenaire. Passenger cars, trucks, tractors, accessories, etc.**
- Seville, Spain, May, 1923—International Road Congress.**
- Rome, Italy, March 19 to 24, 1923—General meeting, International Chamber of Commerce.**

General Motors Corporation Explains Extent of Its Activities

Group Now Comprises 33 Manufacturing Units, 26 Sales Concerns and 8 Miscellaneous Companies

With the dividend checks mailed to General Motors stockholders November 1, there was included a pamphlet "Facts and Figures," dealing with the history and the various present activities of General Motors Corporation. Total assets of the Corporation June 30, 1922 amounted to \$500,526,600; in addition to these assets, the corporation owns a large part or all of the capital stock of a number of companies directly connected with its activities; these are carried on the books at \$57,289,030. Excess of current assets over current liabilities was \$122,725,264. Cash in banks, \$35,527,973. Sight drafts \$10,430,382. Notes and accounts receivable, \$21,899,134. Inventory, \$94,166,601. Current liabilities include accounts payable, \$22,184,843; taxes, payrolls, etc., \$16,979,253; and accrued dividends, \$1,068,354.

In the General Motors group are 33 manufacturing units, located in 33 cities, 26 sales concerns and eight miscellaneous companies, a total of 67 units. In addition, the manufacturing divisions have large investments in factory branches, service stations and retail stores, located in the principal cities.

Canadian activities of General Motors have reached large proportions, functioning through General Motors of Canada, with plants at Oshawa and at Walkerville, Ont. Export business is cared for by the General Motors Export Co., and General Motors, Ltd., of Great Britain and is now of large volume. Since 1912 more than 94,000 General Motors cars have been exported, over 50 per cent of them in the last two and a half years.

Combined sales by car and truck divisions of General Motors in the first quarter of 1922 totaled 71,039; second quarter, 135,751; third quarter 109,346. The nine months of 1922 thus produced sales of 316,136—more than the whole of 1921. With conservative estimates for the last quarter of the year, General Motors sales by divisions will be for the whole of 1922, as follows: Passenger cars—Buick, 134,000; Cadillac, 22,000; Chevrolet, 249,000; Oakland, 26,000; Oldsmobile, 23,000; total, 454,000. Commercial cars—Chevrolet, 2,900; GMC trucks, 5,600; Oldsmobile, 1,500; total, 10,000. With miscellaneous cars of 4,355, the grand total amounts to 468,355.

In handling quantity sales, credit facilities are essential and to meet the need the General Motors Acceptance Corporation was formed in 1919, under the banking laws of New York state. Since that time there have been financed under its retail plan more than 200,000 motor vehicles and under its wholesale plan more than 140,000 vehicles. The combined retail value of motor cars financed is over \$400,000,000. The Acceptance Corporation has negotiated over \$290,000,000 of its obligations with banking institutions throughout the United States.

At the present time there are approximately 70,000 stockholders in General Motors, 70,000 employees and 12,000 dealers and distributors—152,000 people actually connected with the organization. These do not, of course, include the large number of employees in the service of General Motors dealers and distributors, nor the employees in garages and repair stations authorized to give service on General Motors cars.

The number of stockholders has grown from 2,920 in 1917. There are now 41,144 stockholders owning 100 shares or less of common stock and only 7,410 who own more than 100 shares of common; 14,774 own 10 shares or less.

Proposed Bus Lines for Streets of Philadelphia

A system of bus lines to supplement the trolley lines of Philadelphia, is planned by the Philadelphia Rapid Transit Co., under the direction of Thomas F. Mitten, president. A special double-decked bus, designed by Mr. Mitten, has already been built and trial trips made over a proposed routes.

The vehicle seats 51 passengers and is capable of a maximum speed of 35 miles an hour, with a normal speed of 20 m.p.h. It is similar in design to the Fifth Ave. buses with several innovations. The seats of the upper deck are topped with a protecting roof while a periscope arrangement will enable the conductor on the lower floor to see that every passenger is seated before the start signal is flashed to the motorman. The bus is to cost \$12,000.

Wood Heads Fifth Avenue Coach Company

Frederic T. Wood is announced as president and general manager of the Fifth Avenue Coach Co., and the New York Transportation Co., to fill the vacancy left by the resignation of John A. Ritchie, who has become head of the Chicago Motor Bus Co.

The Chicago Motor Bus Co., which is capitalized at \$3,000,000, plans an extension of the Chicago bus system to the city's boulevards and the scraping of all but six of the buses now in operation. New buses are to be installed to the extent of 250 or more. Associated with Mr. Ritchie in this enterprise is John Hertz, president of the Yellow Taxi Co., of Chicago, Charles MacCullough, Chicago banker; William Wrigley, Jr., chewing gum manufacturer, and a member of both the Armour and Swift families.

Bus Used in Newburgh Traction System

Among those traction companies fast joining the ranks of motor bus users is the Orange County Traction Co., Newburgh, N. Y., which recently put buses into service on two of its lines, replacing six trolley cars with seven motor vehicles. The buses are of the type used by the Fifth Avenue Coach Co., only smaller.

Autocar Celebrates Its Quarter of a Century Anniversary

Ardmore Company Commemorates Anniversary With the Publication of a Historical Brochure

Weathering the storm of business prosperity and depression, passing through every phase of an infant industry, the Autocar Company of Ardmore, Pa., completed its 25th year of existence on October 21, 1922. Beginning at a time when the automobile was still somewhat of a plaything, the company is now one of the few surviving pioneers, of that period.

Louis S. Clark, who with his brother, John S. Clark, founded the Autocar Company, made his first drawings of automobile design in 1890, going so far as to complete a prospectus in that year for the manufacturing company which was finally organized on October 21, 1897.

In that year Mr. Clarke combined his interests with those of William Morgan who had been carrying on similar experimental work in Pittsburgh and that combination of interests marked the real beginning of the Autocar Co. The Autocar Co. was incorporated under its present name in 1899 and early in the next year moved from Pittsburgh to the present location in Ardmore, Pa.

When the Automobile Club of America organized the first endurance run from New York to Buffalo in 1901, the Autocar Co. entered two of its Type VI cars. There was so much trouble with chains breaking on the sprocket wheel during that first endurance run that Mr. Clarke decided that chains must be eliminated before the automobile could be adequately developed for general use. As soon as he returned to Ardmore, he started designing a shaft-driven car which, only two and one-half months later, was completed and driven by him to the Automobile Show in New York. That was the first shaft-driven car built in America, it is claimed, and the first of its kind ever exhibited in New York.

Work on Autocar commercial trucks was begun seriously in 1907. The first commercial car was sold in 1908 and remained continuously in service for three years until it was traded by its owner for a type 21UF Autocar. The type 21UF Autocar is still in production at the Autocar plant. It and the type 21UG are both equipped with the distinctive Autocar 2-cylinder motor. Four different 4-cylinder models, ranging from two to six tons capacities, now complete the Autocar line.

In addition to its manufacturing headquarters at Ardmore, the Autocar Co. now maintains and operates 36 direct factory branches covering the entire country.

The company is commemorating the anniversary with the publication of an attractive brochure containing a history of the company, photographs of the various models, including the old passenger car types, officials of the company and a complete list of all the employees.

Three Billion for Highway Federal Aid in Next Twenty Years

Program Will Constitute 180,000 miles of Improved Highways at \$17,000 Per Mile

Fifteen to twenty years of building good roads lie ahead of the United States. Under the program which the country has adopted there will be built, during that time, 180,000 miles of improved highways which will constitute the Federal-aid highway system and an equal or greater mileage of State and local roads. When the great job is done, transportation facilities of the country will far exceed those of any other nation, past or present, in the world. The highways of the ancient Romans, whose fame has come down through the centuries, will pale with comparison.

Officials of the bureau place the aggregate cost of the Federal-aid program alone at about \$3,000,000,000, spread over the twenty-year period. They base this estimate on an average cost of \$17,000 per mile. The average cost, in turn, takes into consideration all classes of improved roadways from the cheapest to the most expensive types. Approximately one-third of the proposed system, or 60,000 miles of improved highways, already are either built or building.

The program is a new one. Up to comparatively recent years, road-building in the United States had been conducted without special regard to a national system. Highways had been constructed where needed without considering whether they would link up in the most effective manner with the whole network of roads to be spread over the Nation. Engineers had sought more to meet immediate and local demands than the broader requirements of the states and nation.

The present Federal-aid road-building program, officials of the bureau state, will contemplate the construction of only such roads as fit into the national program and contribute to the national system. At the same time the roads will be so selected as to serve the most important local requirements. With marked modifications, the system adopted in building the railways of the country will be borne in mind in the construction of the country's new highways. There will be main lines of highway communication between centers and thousands of miles of feeder roads, reaching back into the sparsely settled regions and into the rich agricultural sections, to tap areas whose population and products will flow over the new system.

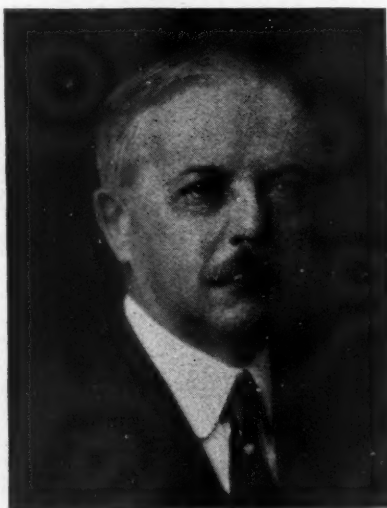
New roads will be planned and built—thousands of miles of them—where they will fit in most advantageously with the entire program. The bureau is continuing its research work into most efficient methods of road-building, including the character and wearing power of materials, resisting qualities of varying sub-soils, etc., and has amassed a considerable store of valuable information all of which will be available for the highway engineer of tomorrow, whom the Board is seeking to have educated.

Seiberling Rubber Introduces New Pneumatic Truck Tire

A new pneumatic truck tire, known as the All-Tread truck cord, is now being produced by the Seiberling Rubber Co., Akron, O. This casing will be made in the following sizes: 30 x 3½, 32 x 4½, 34 x 4½, 33 x 5, 34 x 5, 35 x 5, 36 x 6, 38 x 7, and 40 x 8. The 30 x 3½ is of 3.85 dimension, six ply, for Ford delivery trucks, and for use on Ford passenger cars when road conditions are severe.

The introduction of this tire recalls the numerous achievements of F. A. Seiberling, president of the company, in the tire industry. Few men today have contributed more to the advancement and popularity of the pneumatic casing.

Mr. Seiberling founded the Goodyear Tire & Rubber Co., in 1898, and served



Frank A. Seiberling

President of the Seiberling Rubber Co., Akron, Ohio

as its president until the reorganization of that company, May, 1921. He has been responsible for a number of the outstanding developments in tire construction, having invented the straight-side tire and the tire building machine, the apparatus that has been instrumental in cutting down the costs of tires. His patents on this machine are the subject of current litigation, a favorable decision having just been rendered in a patent infringement suit against the John A. Thropp & Sons Co., Trenton, N. J.

Mr. Seiberling was the champion from the start, of the small cord vs. the cable cord principle. The small cord now is in popular use. Another invention of his is the first practical Q. D. rim with locking ring.

The development of the big pneumatic tire for trucks has always been one of his hobbies. He has been active in its growth from the experimental stage to the present type as a component part of commercial transportation.

In 1917, Mr. Seiberling addressing his Board of Directors, said that in his opinion the cord tire would practically replace the fabric type within three years, his forecast being based on the premise that cord tire construction costs would be reduced to a point where the differential between fabric and cord tires would be exceedingly slight.

Big Truck Year for 1923 Predicted at Federal Convention

Distributors Hear Optimistic Speeches at Five-Day Convention in Detroit. Fenn Speaks at Dinner

Featured by speeches predicting the rapid growth of the motor truck, as a means of transportation, within the next five years, a dinner at the Detroit Athletic Club and an excursion to Muskegon, Mich., the annual convention of the distributors of the Federal Motor Truck Co., of Detroit, closed Oct. 21. More than 75 distributors from all sections of the country attended the meeting.

The convention opened on October 16, the day being given over to talks by C. L. Wood, chief engineer, on the Federal trucks. On Tuesday, Mr. Wood and W. L. Pulcher, vice-president and general manager, were the speakers.

Mr. Pulcher predicted that within the next five years the truck industry would see the most prosperous era in its history. He went on to state that in his opinion the truck manufacturers, distributors and dealers who were still left in the business after the trying depression of 1921, were about to "cash in" on not only their tremendous investment but on their efforts to build up a paying industry and at the same time to benefit the country's sadly disorganized transportation system.

On Wednesday, F. L. Pierce, general sales manager, addressed the distributors and told them of the organization of the sales force. L. B. Dudley, advertising manager, also spoke on the advertising program and R. H. Crooker, sales promotion manager, spoke on the plans of his department for the next year. On Thursday, Mr. Pulcher spoke again on "Some Pertinent Questions to Distributors" and during the afternoon he spoke on "What is Expected of the Federal Distributing Organization in 1923."

With the close of the convention sessions Thursday, the delegates adjourned to the Detroit Athletic Club where a dinner was given by the company. Among the speakers at the dinner was F. W. Fenn, chairman of the motor truck committee of the National Automobile Chamber of Commerce. James Schermerhorn, of Detroit, was the toastmaster and told many of his stories for which he is famous throughout the country. At the end of the dinner the delegates boarded a special train for Muskegon and spent Friday inspecting the plant of the Continental Motor Company there.

Driggs-Diamond Contract Annulled

Plans for manufacturing taxicabs for the Diamond Taxicab Co., by the Driggs Ordnance & Manufacturing Co., have fallen through, it is announced. The annulment of contract has resulted in the formation of its own selling organization on the part of the Driggs company which is to be known as the Driggs Taxicab Sales Co., with E. E. Garrison in charge of the sales. The taxicab is to sell for \$1950 f.o.b. New York.

Preparations Progressing for Good Roads Congress

With the early start that was made during the summer through a partial reorganization and an election of officers in the American Road Builders' Association and the creation of the Highway Industries Exhibitors' Association to bring about closer co-operation, arrangements are rapidly being perfected for the Thirteenth American Good Roads Congress and Fourteenth National Good Roads Show to be held in Chicago, January 15, 16, 17, 18 and 19, 1923.

It is the intention to separate the congress and show, by holding the former at the Congress Hotel and the latter as usual at the Coliseum. It is believed this arrangement will be more satisfactory as it will obviate the necessity of shutting down the operating machinery during the sessions and will eliminate the noise that has proved so annoying to speakers and delegates at the convention. The new arrangement is also expected to increase the attendance at each session of the congress.

The Exhibitors' Committee has employed a professional director of exhibits in C. W. Kelley of Chicago, who, though never before identified with the road show, has managed some of the biggest expositions in the country, and the Publicity Committee has re-engaged C. S. Lee of New York, who handled the publicity work for the shows and conventions in 1921 and 1922.

The American Road Builders' Association has opened new offices at 37 West 39th St., New York City, the old ones at 11 Waverly Place having been abolished. Headquarters will also be opened in Chicago long in advance of the congress and show.

Highway Courses Popular at Michigan

Arthur H. Blanchard, professor of highway engineering and highway transport, of the University of Michigan, Ann Arbor, has announced the schedule for the 1922-1923 Graduate Short-Period Courses in Highway Engineering and Highway Transport which will be offered by the University of Michigan during the winter period. The courses opened December 4, 1922 and end March 16, 1923.

The attendance on these courses has steadily increased during the past three years as indicated by the following data: 1919-20, 29 men; 1920-21, 45 men; and 1921-22, 94 men. The average age of the men in attendance last winter was 27 years, varying from 22 to 54 years.

The Board of Regents of the University, in recognition of the rapid development of the course, has assigned to the Division of Highway Engineering, 26,000 sq. ft. of working space for the Davis Library of Highway Engineering and Highway Transport, offices, graduate lecture rooms, drafting rooms and laboratories in the new \$750,000 Engineering building.

This university is the only institution offering such a course for credit towards advanced degrees.

Enthusiastic Sessions at Highway Education Conference

Greetings from President Harding opened the second national conference on education for highway engineering and highway transport held under the auspices of the Highway Education Board at the New Willard Hotel, Washington, D. C., October 26, continuing until the 28th.

"We all agreed," writes the President, "that the country needs good roads and more of them, but we also have been brought to realize that they are not to be had without very great expense. Your organization is one of those particularly well equipped to deal with the industrial and technical side, as well as the financial aspect of this problem and I most earnestly hope that your Washington convention will produce some useful illumination of the problem."

More than 400 delegates were in attendance, the largest gathering of representative authorities on highways and transport engineering ever held in the United States. The educational side of the highway problem was stressed, the need for the proper training of highway experts and the necessity for the dissemination of the gospel of good roads throughout the country.

All through the speeches ran the dominant need of a greater realization of the importance of the nation's highways. Thomas H. MacDonald, chief of the Bureau of Public Roads stressed this point when he stated that a very large portion of the population of the country would be directly interested in highways through the big Federal-aid Program of state roads which is to cover the next ten years and include 180,000 miles of improved highways. Mr. MacDonald also spoke of the need for trained engineers capable of executing the government's road program.

In his paper on "Problems in Highway Finance," A. J. Brosseau, president of Mack Trucks, Inc., conceded the advisability of using long term highway bond issues to finance road construction, but he emphatically believed that the highway once built, must be maintained. The speech of W. H. Lyford, appears elsewhere in this issue.

In speaking of the benefits which will, and have accrued from better highway transportation, George M. Graham, vice-president of the Chandler Motor Car Co., said, "The benefit will spread itself principally to two great classes, as follows: First, to three and a half million farmers dependent upon their automobiles. Second, to as many more city dwelling families with incomes of less than \$4,000 per year, who with the farmers own two-thirds of all the automobiles sold. The motor vehicle actually gives this country some 11,000,000 transportation monopolies, all, whether truck or passenger car, subject to schedules and routes made by the owner. This means individual transportation."

Among the other excellent speeches, the following men delivered particularly noteworthy addresses: Prof. Arthur H. Blanchard, University of Michigan; Prof. T. R. Agg, Iowa State College; Dr. W. K. Hatt, National Research Council; and C. J. Galpin, U. S. Department of Agriculture.

Tire-Changing Contest at the N. T. D. A. Convention

As we go to press the second annual convention of the National Tire Dealers' Association is about to go into convention at the Hotel Pfister, Milwaukee, Wis., November 14 to 16. This organization, only two years old has enjoyed a rapid and prosperous growth, and now has a large affiliated group of local and state associations.

Although members of the N. T. D. A. can vote for the election of officers, every dealer will be admitted to all of the sessions and have an equal opportunity to participate in the discussions.

One of the important features of the convention will be contests to determine the tire-changing championship of the country. During the past year several remarkable records for rapid tire-changing has been established in various parts of the country, and as a result considerable interest has been developed in this form of competition. While each city boasts of its "fast tire changer," the marks made last August by Charles W. Paine, of Philadelphia, have not been equalled.

At that time, Paine, timed by three watches held by presidents of local automotive trade organizations, mounted a 35 x 5 casing on a 34 x 4½ split rim and inflated the tube to 70 pound pressure in one minute. He also applied a 30 x 3½ casing with his bare hands in 32/5 seconds. Karl Mitz, of Drayton, N. D., came closest to equalling one of Paine's records, when on July 4 he applied a Ford casing in five seconds.

Specialists from all parts of the country will compete with Paine and Mitz at the Milwaukee convention.

Trucks Under Consideration of Rivers and Harbors Congress

In the symposium on "The American Transportation Problem and Its Solution," to be presented at the National Rivers and Harbors Congress at the New Willard Hotel, Washington, D. C., December 6 and 7, the subject is to be presented from the following angles: Railways, waterways, motor trucks and highways and the merchant marine. The N. A. C. C. has agreed to furnish a speaker to present the matter from the truck and highway standpoint, the name to be announced later. There will also be some discussion, which may be informal or general, regarding the suggested imposition of tolls upon boats and motor trucks that compete with railways.

Bartholomew Heads the N. A. F. E. M.

J. B. Bartholomew, pioneer tractor manufacturer, farmer and inventor, president of the Avery Company, Inc., has been honored with the presidency of the National Association of Farm Equipment Manufacturers. Mr. Bartholomew has been with the Avery Co. for 43 years, beginning with this company at the very bottom of the ladder. He has done much toward promoting the use of the truck on the farm and is a firm believer in the future of the motorized farm.

Personal Items

G. P. Atkinson, for several years connected with the home office sales organization of the Weston Electrical Instrument Co., of Newark, N. J., has opened an office for this company in Atlanta, Ga. His territory will include Georgia, South Carolina, and Northern Alabama.

A. C. Behringer has been appointed assistant sales manager, and Arthur S. Goodall, advertising manager of the Dorris Motor Car Co., St. Louis, Mo. Both men have been members of the company for several years.

C. O. Brandes, who has been in the tire industry since 1907, and has been export manager of the Firestone Tire & Rubber Co., for many years, has been engaged as export manager of the Erie Tire & Rubber Co., Sandusky, O., with Export Offices at 5511 Euclid Ave., Cleveland.

Richard Horn, who for the last four years has been district sales representative at Portland for the Cleveland Tractor Co., has resigned and will represent Bear Tractors Inc., as district sales manager on the Pacific Coast.

I. M. Lewis has severed his connections with the Bessemer Motor Truck Co., Grove City, Pa. The resignation took effect November 1.

D. A. McConnell, president and general manager of the Klaxon Co., has announced his resignation from the company, withdrawing from all interest in the concern by the first of the year. He has been an important factor in bringing the Klaxon Co. to its present standing in the trade today.

E. C. Miner, formerly advertising manager and for the past year assistant sales manager of the Multibestos Company, Walpole, Mass., has been announced as sales manager of the company.

William M. Sweet has been appointed general manager of the Klaxon Company of Bloomfield, N. J. Mr. Sweet, who for several years has been a director and vice-president of the Klaxon Co., relinquished his other General Motors duties last October to devote his attention to Klaxon.

Removals and Trade Changes

The Westinghouse Electric and Manufacturing Co. has opened a new plant which includes an assembling and repair shop, a warehouse and a district sales office at Seattle, Wash. All activities in that district are now centered in one plant.

The Transport Motor Co., Transport distributor at Spokane, Wash., is now occupying new service and sales rooms at 1103 W. Sprague Ave., which has a frontage of 150 ft. F. M. Greene is president of the company.

The United States Asbestos Co. has moved its general offices from 45 N. Duks St., Lancaster, Pa., to temporary but adequate quarters at the plant at Manheim, Pa., pending the erection of a permanent office building.

The Prest-O-Lite Co., Inc., announces the removal of its main offices from New York City to Indianapolis, Ind. This move brings sales, service and production into close relation at the most central point of distribution east of the Rocky Mountains.

The Republic Truck Corp., Seattle branch, is now located in its new home at the corner of Pine and Bellvue, Seattle, Wash. The new quarters consist of a three-story building, affording ample floor space. Scott E. Bird is resident manager.

The Inland Products Co., of St. Louis, is now in its new three-story plant. To the well-known line of piston rings has been added the StepSet, a quick seating step-cut ring. B. G. Brennan has been added to the executive staff as general sales manager.

Eastern Thomart, Inc., 90 Bigelow St., Newark, N. J., has taken over the distribution of Thomart speed trucks for the entire Eastern section. William G. Toland, former vice-president of sales for Hare's Motors, heads the new company. Other officers are: W. S. Hill, vice-president; William J. Foster, secretary and treasurer, and William Carl Chapman, advertising and sales promotion manager.

Obituary

W. M. Waller, who has represented the Perfection Spring Co. in the replacement sales in the middle west and southwest, died October 22 after an extended illness. Mr. Waller was a man of fine sterling qualities which fact won for him the friendship of men in the industry wherever he has come in contact with them. Before going with the Perfection Spring Co. he was with the Johnson Bros. Auto Supply Co., of Wichita, Kan. He died at his home in Waco, Texas.

Charles H. Woodruff, former sales manager of the O. Armleder Co., Cincinnati, O., died at his home at Dayton, O., October 20, due to an acute attack of indigestion. Mr. Woodruff was held in very high esteem by the officials of this company and its employees, all of whom greatly deplore his death.

Literature

Modern Freight Transportation, published by the General Motors Truck Co., Pontiac, Mich., in conjunction with the Detroit Trailer Co., of Detroit, is said to be the first effort that has ever been made whereby a concerted action has been taken by a truck company and a trailer company to lay before the public, facts on modern freight transportation. Beside a number of enlightening illustrations showing the various uses of the combination of a truck and trailer there is a chart on "Five Systems of Modern Highway Transportation," with the daily operating costs of each system.

Dyke's Automobile & Gasoline Engine Encyclopedia, 13th edition, has just been published for 1922. This volume by A. L. Dyke has grown each year since its inception until it is now the most complete work on the automobile published. The new edition has been improved by the introduction of an index covering 14,000 subjects. The text has been entirely re-written and the number of illustrations increased by several hundred. There is an especially interesting section on trucks and commercial cars as well as many useful repair hints. Published by Goodheart-Wilcox Company, Inc., Chicago.

Motor Vehicles and Their Engines, described as a practical handbook of the care, repair and management of motor trucks and automobiles for owners, chauffeurs, garagemen and schools, can be read by those within the trade to great advantage. The book, which is now in its second addition, revised and enlarged, was written by Edward S. Fraser and Ralph B. Jones, both well-known authorities on motor vehicles. Publishers: D. Van Nostrand Co., 8 Warren St., New York.

Better Built Bus Bodies is the name of an artistic catalog released by the Bus Body Corp., Evansville, Ind. The book gives specifications, photographs and descriptions of bodies to fit every bus purpose.

Factory News

The Robert Bosch Magneto Co., Inc., 121 West 64th St., New York, recently received a large contract from Rauch & Lang, Chicago Falls, Mass., for Robert Bosch ZU4 Waterproof magnetos.

The Black & Decker Mfg. Co., Towson Heights, Baltimore, Md., has made a reduction of \$11 in the price of its Standard 1/4-in. electric drill.



Frank A. Shuler

Who resumes the portfolio of director of engineering and manufacturing with the reorganized Shuler Axle Co., Inc., Louisville, Ky. W. E. Dugan has also been made vice-president and general manager of this company



James G. Murray

Well known in eastern motor truck circles who was recently made division sales manager of the Service Motor Truck Co., Wabash, Ind. He will maintain headquarters at 150 High St., Waltham, Mass.



Fred L. Martin

Who has resigned as sales manager of the Sheldon Axle & Spring Co., to become eastern district manager of Fageol Motors Co., Oakland, Cal. He has been with the Sheldon Co. since 1911. His headquarters will be Wilkes-Barre, Pa.



F. E. Booth

Assistant sales manager of the Motor Bearings Div., Hyatt Roller Bearing Co., who has been announced as sales manager of that company. He is a Yale Sheffield school graduate and has had extensive engineering and sales experience.

Replacement Table—Corrected Monthly

Including Piston Ring Sizes, Carburetor Sizes, Hose Sizes, Fan Belt Sizes, Brake Lining Sizes and Truck Frame Dimensions

Note: Under Carburetor Inlet Diameter Will be Found Either the Size of Main Air Intake or the Gasoline Fuel Line
Fan Belt Type: V—V-Shape, F—Flat, R—Round

Name, Model and Tonnage	ENGINE										BRAKE LINING								FRAME			
	Piston Rings		Carburetor			Upper Hose		Lower Hose		Fan Belt			Service				Emergency				Length	Width
	No. per Cyl.	Width	Outlet Diameter	Inlet Diameter	Vertical or Horizontal	Length	Width	Length	Width	Length	Width	Type	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Acc. Series A-1 1/2	3	1 1/2	1 1/2	1 1/2	H	10 3/4	2 1/4	6 1/2	2	37 1/2	1	F	12	3 1/4	1/4	4	12	3 1/4	1/4	4	122 1/2	32
Acc. Series A-2 1/2	4	1 1/2	1 1/2	1 1/2	H	10 3/4	2 1/4	5 1/2	2	33	1 1/4	F	13	3 1/4	1/4	4	13	3 1/4	1/4	4	144 1/2	32
Acc. 20-1	3	1 1/2	1 1/2	1 1/2	H	11	2 1/4	11	2	38 3/4	1 1/4	V	10 1/2	3 1/4	1/4	4	10 1/2	3 1/4	1/4	4	110 3/4	34
Acc. 30-1 1/2	4	1 1/2	1 1/2	1 1/2	H	11	2 1/4	11	2	38 3/4	1 1/4	V	12	3 1/4	1/4	4	12	3 1/4	1/4	4	110 3/4	34
Acc. 40-2	4	1 1/2	1 1/2	1 1/2	H	8	2 1/4	11 1/2	1 1/4	40	1 1/4	V	12	3 1/4	1/4	4	12	3 1/4	1/4	4	123 3/4	34
Acc. 60-3	4	1 1/2	1 1/2	1 1/2	H	11 1/2	2 1/4	11 1/2	2	39 1/4	1 1/4	F	13	3 1/4	1/4	4	13	3 1/4	1/4	4	132 3/4	34
Acc. 60L-3	4	1 1/2	1 1/2	1 1/2	H	11 1/2	2 1/4	11 1/2	2	41 1/4	1 1/4	F	13	3 1/4	1/4	4	13	3 1/4	1/4	4	140 3/4	34
Acc. 90-4 1/2	4	1 1/2	1 1/2	1 1/2	H	11	2 1/4	13	1 1/4	41 1/4	1 1/2	F	15 1/2	3 1/4	1/4	4	15 1/2	3 1/4	1/4	4	150 3/4	36
Acc. 125-6 1/2	3	1 1/2	1 1/2	1 1/2	H	11	2 1/4	14	2	40 1/2	2	F	18	4	1/4	4	18	4	1/4	4	159 3/4	37
American 25-2 1/2	4	1 1/2	1 1/2	1 1/2	H	19	1 1/4	17	1 1/4	38	2	F	19	2 1/4	1/4	2	19	2 1/4	1/4	2	142	33
American 40-4	4	1 1/2	1 1/2	1 1/2	H	19	1 1/4	9 1/2	1 1/4	38	2	F	57	2 1/2	1/4	2	41 1/2	2 1/2	1/4	2	142	37
American 50-5	4	1 1/2	1 1/2	1 1/2	H	19	1 1/4	9 1/2	1 1/4	38	2	F	57	2 1/2	1/4	2	41 1/2	2 1/2	1/4	2	158	37
Apex C-1	3	1 1/2	1 1/2	1 1/2	H	12	2 1/4	12	2	36 1/4	1 1/4	F	42	2 1/2	1/4	2	41 1/2	2 1/2	1/4	2	102	35 1/2
Apex D-1 1/2	3	1 1/2	1 1/2	1 1/2	H	7 3/4	2 1/4	12	2	36 1/4	1 1/4	F	42	2 1/2	1/4	2	41 1/2	2 1/2	1/4	2	102	35 1/2
Apex E-2 1/2	4	1 1/2	1 1/2	1 1/2	H	7 3/4	2 1/4	12	2	32	1 1/4	F	54	2 1/2	1/4	2	41 1/2	2 1/2	1/4	2	128	31 1/2
Apex G	3	1 1/2	1 1/2	1 1/2	H	12	2 1/4	15 1/2	2	34 1/4	1 1/4	F	24	2 1/2	1/4	2	41 1/2	2 1/2	1/4	2	102	35 1/2
Armleder 21-1 1/2	4	1 1/2	1 1/2	1 1/2	H	12	2 1/4	16 1/2	2	31 1/4	2	F	11 1/4	3 1/4	1/4	4	11 1/4	3 1/4	1/4	4	Opt	32
Armleder 40B-1 1/2	4	1 1/2	1 1/2	1 1/2	H	10 3/4	2 1/4	11 1/2	2	33 1/4	2	F	13 1/4	3 1/4	1/4	4	11 1/2	3 1/4	1/4	4	Opt	32
Armleder 40C-1 1/2	3	1 1/2	1 1/2	1 1/2	H	10 3/4	2 1/4	11 1/2	2	35	1 1/4	F	13 1/4	3 1/4	1/4	4	11 1/2	3 1/4	1/4	4	Opt	32
Armleder KWB-3 1/2	4	1 1/2	1 1/2	1 1/2	H	12	2 1/4	16 1/2	2	35 1/4	2	F	42	3	1/4	1	16	3 1/4	1/4	8	Opt	36
Armleder KWC-3 1/2	3	1 1/2	1 1/2	1 1/2	H	10 3/4	2 1/4	16 1/2	2	35 1/4	2	F	42	3	1/4	1	16	3 1/4	1/4	8	Opt	36
Armleder HWB-2 1/2	4	1 1/2	1 1/2	1 1/2	H	10 3/4	2 1/4	11 1/2	2	33 1/4	2	F	13 1/4	3 1/4	1/4	4	13 1/4	3 1/4	1/4	4	Opt	32
Armleder HWC-2 1/2	3	1 1/2	1 1/2	1 1/2	H	10 3/4	2 1/4	11 1/2	2	35	1 1/4	F	13 1/4	3 1/4	1/4	4	13 1/4	3 1/4	1/4	4	Opt	32
Atco B-1 1/2	4	1 1/2	1 1/2	1 1/2	H	11	2 1/4	11	2	31 1/4	2	F	25 1/2	2 1/2	1/4	4	18	2 1/2	1/4	4	109 3/4	32
Atco B1-1 1/2	4	1 1/2	1 1/2	1 1/2	H	11	2 1/4	11	2	31 1/4	2	F	46	2 1/2	1/4	2	46	2 1/2	1/4	2	109 3/4	32
Atco A-2 1/2	4	1 1/2	1 1/2	1 1/2	H	12	2 1/4	11	2	33 1/4	1 1/4	F	25 1/2	2 1/2	1/4	4	18	2 1/2	1/4	4	124 1/2	33
Atlas 22-1	3	1 1/2	1 1/2	1 1/2	H	10 3/4	2 1/4	11	2	33 1/4	1 1/4	F	40	2	1/4	2	22 1/2	2 1/2	1/4	1	84 3/4	33 3/4
Atterbury 20R-1 1/2	4	1 1/2	1 1/2	1 1/2	H	8	2 1/4	14	1 1/4	38 1/4	1 1/4	F	11 1/4	3 1/4	1/4	4	11 1/4	3 1/4	1/4	4	122 1/2	34
Atterbury 22C-2 1/2	4	1 1/2	1 1/2	1 1/2	H	10 3/4	2 1/4	16	1 1/4	40 1/4	1 1/4	F	13 1/4	3 1/4	1/4	4	13 1/4	3 1/4	1/4	4	129 1/2	34
Atterbury 22D-3 1/2	4	1 1/2	1 1/2	1 1/2	H	10 3/4	2 1/4	16	1 1/4	40 1/4	1 1/4	F	15 1/4	3 1/4	1/4	4	15 1/4	3 1/4	1/4	4	142 3/4	37 1/2
Atterbury 8E-5	3	1 1/2	1 1/2	1 1/2	H	14	2 1/4	20 1/2	2	40	2	F	17 1/4	4	1/4	4	17 1/4	4	1/4	4	157 3/4	37 1/2
Autocar XXI-F-2	4	1 1/2	1 1/2	1 1/2	H	3	1 1/4	4	1 1/4	...	...	F	16 1/4	2 1/2	1/4	4	13	2 1/2	1/4	4	91	34
Autocar XXI-C-2	4	1 1/2	1 1/2	1 1/2	H	3	1 1/4	4	1 1/4	...	...	F	16 1/4	2 1/2	1/4	4	13	2 1/2	1/4	4	114	34
Autocar XXVI-Y4	3	1 1/2	1 1/2	1 1/2	H	3 1/4	1 1/4	3	1 1/4	49 1/4	2	F	25	2 1/2	1/4	4	25 1/2	2 1/2	1/4	4	140	34 1/2
Autocar XXVI-B4	3	1 1/2	1 1/2	1 1/2	H	3 1/4	1 1/4	3	1 1/4	49 1/4	2	F	25	2 1/2	1/4	4	25 1/2	2 1/2	1/4	4	176	34 1/2
Autocar XXVII-H4	3	1 1/2	1 1/2	1 1/2	H	3 1/4	1 1/4	3	1 1/4	47 1/4	2	F	22 3/4	2	1/4	4	22 3/4	2	1/4	4	131 1/2	34 1/2
Autocar XXVII-K4	3	1 1/2	1 1/2	1 1/2	H	3 1/4	1 1/4	3	1 1/4	47 1/4	2	F	22 3/4	2	1/4	4	22 3/4	2	1/4	4	155 1/2	34 1/2
Available H-1 1/2	4	1 1/2	1 1/2	1 1/2	H	11	2 1/4	14	1 1/4	40	2	F	48	2 1/2	1/4	2	36	2 1/2	1/4	2	120	32
Available H-2 1/2	3	1 1/2	1 1/2	1 1/2	H	11	2 1/4	14	1 1/4	40	2	F	13 1/4	3 1/4	1/4	4	13 1/4	3 1/4	1/4	4	144	32
Available H3	3	1 1/2	1 1/2	1 1/2	H	11	2 1/4	14	1 1/4	42	2	F	16	4	1/4	4	16	4	1/4	4	168	36
Available H5	3	1 1/2	1 1/2	1 1/2	H	12	2 1/4	16	2	40	2	F	18	4	1/4	4	18	4	1/4	4	168	38
Available H2	4	1 1/2	1 1/2	1 1/2	V	12	1 1/4	14	1 1/4	40	2	F	48	2 1/2	1/4	2	36	2 1/2	1/4	2	120	32
Available H2 1/2	4	1 1/2	1 1/2	1 1/2	V	12	1 1/4	14	1 1/4	40	2	F	13 1/4	3 1/4	1/4	4	13 1/4	3 1/4	1/4	4	144	32
Available H3 1/2	4	1 1/2	1 1/2	1 1/2	V	12	1 1/4	14	1 1/4	42	2	F	16	3 1/4	1/4	4	16	3 1/4	1/4	4	168	36
Available H5	4	1 1/2	1 1/2	1 1/2	V	12	2 1/4	16	2	40	2	F	18	4	1/4	4	18	4	1/4	4	168	38
Avery 1	3	1 1/2	1 1/2	1 1/2	H	10	2 1/4	6 1/2	2	31 1/4	1 1/2	F	19 1/4	2	1/4	4	18 1/4	2	1/4	4	85	34
Bell M-1	4	1 1/2	1 1/2	1 1/2	V	10	1 1/4	10	1 1/4	32	2	F	36	2 1/2	1/4	1	42	3	1/4	1	110	34
Bell E-1 1/2	4	1 1/2	1 1/2	1 1/2	V	10	1 1/4	10	1 1/4	32	2	F	39	2 1/2	1/4	1	48	3	1/4	1	114	34
Bell O-2 1/2	4	1 1/2	1 1/2	1 1/2	V	10	1 1/4	10	1 1/4	32	2	F	48	2 1/2	1/4	1	54	3	1/4	1	126	34
Bessemer G-1	3	1 1/2	1 1/2	1 1/2	V	11 1/2	2 1/4	10	2 1/4	42	1 1/4	V	47 1/4	2 1/2	1/4	2	45 1/4	2 1/2	1/4	2	98 1/4	34
Bessemer H-2-1 1/2	3	1 1/2	1 1/2	1 1/2	V	11 1/2	2 1/4	10	2 1/4	43	1 1/4	V	56 1/4	2 1/2	1/4	2	55	2 1/2	1/4	2	116	34
Bessemer J2-2 1/2	3	1 1/2	1 1/2	1 1/2	V	12	2 1/4	5	1 1/4	36 1/4	1 1/4	F	56 1/4	2 1/2	1/4	2	55	2 1/2	1/4	2	142 3/4	34
Bessemer K2-4	3	1 1/2	1 1/2	1 1/2	V	11 1/2	2 1/4	10	2 1/4	39 3/4	1 1/4	F	58 1/4	2 1/2	1/4	2	30 1/4	4 1/2	1/4	1	157 1/2	38
Bethlehem KN-1	3	1 1/td																				

Replacement Table—Continued

Name, Model and Tonnage	ENGINE										BRAKE LINING								FRAME			
	Piston Rings		Carburetor		Upper Hose		Lower Hose		Fan Belt		Service				Emergency				Length	Width		
	No. per Cyl.	Width	Outlet Diameter	Inlet Diameter	Vertical or Horizontal	Length	Width	Length	Width	Length	Width	Type	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Collier 18-1	3	1 1/2	1 1/2	1 1/2	V	9 3/4	2 1/2	10 1/2	1 1/2	40	1 1/2	F	24	3 1/2	1/4	4	24	3 1/2	1/4	4	106	25 1/2
Collier 19-1 1/2	3	1 1/2	1 1/2	1 1/2	V	9 3/4	2 1/2	10 1/2	1 1/2	40	1 1/2	F	24	3 1/2	1/4	4	24	3 1/2	1/4	4	120	32
Collier 21-2	3	1 1/2	1 1/2	1 1/2	V	9 3/4	2 1/2	10 1/2	1 1/2	40	1 1/2	F	27 1/2	3 1/2	1/4	4	27 1/2	3 1/2	1/4	4	132	32
Collier 22-2 1/2	3	1 1/2	1 1/2	1 1/2	V	9 3/4	2 1/2	10 1/2	1 1/2	40	1 1/2	F	27 1/2	3 1/2	1/4	4	27 1/2	3 1/2	1/4	4	144	32
Commerce 9-1500	3	1 1/2	1 1/2	1 1/2	V	10	2 1/2	10	2 1/2	44	1 1/2	V	50	2 1/2	1/4	2	48 1/2	2 1/2	1/4	2	92 1/2	34
Commerce T-1500	3	1 1/2	1 1/2	1 1/2	V	10	2 1/2	10	2 1/2	44	1 1/2	V	50	2 1/2	1/4	2	48 1/2	2 1/2	1/4	2	92 1/2	34
Commerce 12-3000	3	1 1/2	1 1/2	1 1/2	V	10	2 1/2	10	2 1/2	44	1 1/2	V	50	2 1/2	1/4	2	48 1/2	2 1/2	1/4	2	99 1/2	34
Commerce 16-4000	3	1 1/2	1 1/2	1 1/2	V	10	2 1/2	10	2 1/2	44	1 1/2	V	50 1/2	2 1/2	1/4	2	48 1/2	2 1/2	1/4	2	108 1/2	34
Commerce 25B-5000	4	1 1/2	1 1/2	1 1/2	V	9 1/2	2 1/2	15 1/2	1 1/2	42	1 1/2	F	13	3 1/2	1/4	4	13	3 1/2	1/4	4	132	34
Concord A-2	4	1 1/2	1 1/2	1 1/2	H	11	2 1/2	9 1/2	1 1/2	34	1 1/2	F	12	3 1/2	1/4	4	12	3 1/2	1/4	4	108 1/2	32 1/2
Concord AX-2	4	1 1/2	1 1/2	1 1/2	H	11	2 1/2	9 1/2	1 1/2	34	1 1/2	F	12	3 1/2	1/4	4	12	3 1/2	1/4	4	122 1/2	32 1/2
Concord B-3	4	1 1/2	1 1/2	1 1/2	H	11	2 1/2	9 1/2	1 1/2	34	1 1/2	F	13 1/2	3 1/2	1/4	4	13 1/2	3 1/2	1/4	4	122 1/2	32 1/2
Concord BX-3	4	1 1/2	1 1/2	1 1/2	H	11	2 1/2	9 1/2	1 1/2	34	1 1/2	F	13 1/2	3 1/2	1/4	4	13 1/2	3 1/2	1/4	4	155 1/2	32 1/2
Corbitt E-1	3	1 1/2	1 1/2	1 1/2	V	8	2 1/2	14	2 1/2	38	1 1/2	V	19	2 1/2	1/4	2	19	2 1/2	1/4	2	105	34
Corbitt D-1 1/2	3	1 1/2	1 1/2	1 1/2	V	8	2 1/2	14	2 1/2	38	1 1/2	V	19	2 1/2	1/4	2	19	2 1/2	1/4	2	120	34
Corbitt C-2	3	1 1/2	1 1/2	1 1/2	V	14	1 1/2	13	1 1/2	36	1 1/2	F	51 1/2	2 1/2	1/4	1	51 1/2	2 1/2	1/4	1	138	35
Corbitt B-2 1/2	3	1 1/2	1 1/2	1 1/2	V	14	1 1/2	13	1 1/2	36	1 1/2	F	51 1/2	2 1/2	1/4	1	51 1/2	2 1/2	1/4	1	138	35
Corbitt AA-5	3	1 1/2	1 1/2	1 1/2	V	13	1 1/2	8	1 1/2	36	1 1/2	V	69 1/2	3	1/4	1	69 1/2	3	1/4	1	160	38
Corbitt A-3 1/2	3	1 1/2	1 1/2	1 1/2	V	13	1 1/2	8	1 1/2	36	1 1/2	V	69 1/2	3	1/4	1	69 1/2	3	1/4	1	160	38
Cyclone A-3000	3	1 1/2	1 1/2	1 1/2	V	16	2 1/2	16	2 1/2	32 1/2	1 1/2	F	21 1/2	1 1/2	1/4	4	19 1/2	1 1/2	1/4	4	113	34
Dart S-1 1/2	3	1 1/2	1 1/2	1 1/2	H	11	2 1/2	13	1 1/2	36	1 1/2	F	19	1 1/2	1/4	4	19	1 1/2	1/4	4	112	34
Dart M-2 1/2	4	1 1/2	1 1/2	1 1/2	H	11	2 1/2	13	1 1/2	35	1 1/2	F	19	1 1/2	1/4	4	19	1 1/2	1/4	4	124	34
Dart W-3 1/2	4	1 1/2	1 1/2	1 1/2	H	11	2 1/2	13	1 1/2	36	1 1/2	F	28	2 1/2	1/4	4	28	2 1/2	1/4	4	144	38
Day-Elder AS-1	3	1 1/2	1 1/2	1 1/2	V	9	2 1/2	9 1/2	2 1/2	40	1 1/2	V	19	2 1/2	1/4	4	19	2 1/2	1/4	4	108	35
Day-Elder B-1 1/2	3	1 1/2	1 1/2	1 1/2	V	9	2 1/2	9 1/2	2 1/2	40	1 1/2	V	19	2 1/2	1/4	4	19	2 1/2	1/4	4	120	35
Day-Elder D-2	3	1 1/2	1 1/2	1 1/2	V	9	2 1/2	9 1/2	2 1/2	40	1 1/2	V	19	2 1/2	1/4	4	19	2 1/2	1/4	4	125	35
Day-Elder C-2 1/2	3	1 1/2	1 1/2	1 1/2	V	10 1/2	2 1/2	12	1 1/2	36 1/2	2 1/2	F	52	2 1/2	1/4	2	52	2 1/2	1/4	2	123	35
Day-Elder F-3 1/2	3	1 1/2	1 1/2	1 1/2	V	10 1/2	2 1/2	12	1 1/2	35 1/2	2 1/2	F	56 1/2	2 1/2	1/4	2	56 1/2	2 1/2	1/4	2	148	35
Day-Elder E-5	4	1 1/2	1 1/2	1 1/2	V	12 3/4	2 1/2	10	1 1/2	38 1/2	1 1/2	F	69	3	1/4	2	69	3	1/4	2	155	37
Dearborn BW-2	3	1 1/2	1 1/2	1 1/2	V	12 3/4	2 1/2	10	1 1/2	38 1/2	1 1/2	F	18	2 1/2	1/4	2	18	2 1/2	1/4	2	130	32
Dearborn F-1 1/2	3	1 1/2	1 1/2	1 1/2	V	12 3/4	2 1/2	10	1 1/2	38 1/2	1 1/2	F	18	2 1/2	1/4	2	18	2 1/2	1/4	2	130	32
Dearborn C-1	3	1 1/2	1 1/2	1 1/2	V	12	2 1/2	8	1 1/2	37	1 1/2	F	16 1/2	2 1/2	1/4	2	16 1/2	2 1/2	1/4	2	96 1/2	34
Defiance B-1 1/2	3	1 1/2	1 1/2	1 1/2	V	10	2 1/2	8	2 1/2	40 3/4	1 1/2	F	45	2 1/2	1/4	1	45	2 1/2	1/4	1	107	32
Defiance C-2	3	1 1/2	1 1/2	1 1/2	V	10	2 1/2	8	2 1/2	40 3/4	1 1/2	F	54 1/2	2 1/2	1/4	1	52 1/2	2 1/2	1/4	1	116	34
Defiance D	3	1 1/2	1 1/2	1 1/2	V	10	2 1/2	8 1/2	2 1/2	40 3/4	1 1/2	F	54 1/2	2 1/2	1/4	1	52 1/2	2 1/2	1/4	1	116	34
Defiance E	3	1 1/2	1 1/2	1 1/2	V	10	2 1/2	8 1/2	2 1/2	40 3/4	1 1/2	F	54 1/2	2 1/2	1/4	1	52 1/2	2 1/2	1/4	1	120	34
Defiance EL	3	1 1/2	1 1/2	1 1/2	V	10	2 1/2	8 1/2	2 1/2	40 3/4	1 1/2	F	54 1/2	2 1/2	1/4	1	52 1/2	2 1/2	1/4	1	120	34
Denby 31-1 1/2	3	1 1/2	1 1/2	1 1/2	V	6	2 1/2	19	2 1/2	38 1/2	1 1/2	F	49	2 1/2	1/4	2	47 1/2	2 1/2	1/4	2	97 1/2	34
Denby 33-1 1/2	3	1 1/2	1 1/2	1 1/2	V	9	2 1/2	12	2 1/2	41 1/2	1 1/2	V	8 1/2	4	1/4	2	46 1/2	1 1/2	1/4	2	120	33 1/2
Denby 34	3	1 1/2	1 1/2	1 1/2	V	9	2 1/2	12	2 1/2	41 1/2	1 1/2	V	53 1/2	3	1/4	2	50 1/2	3	1/4	2	127	34
Denby 35-2 1/2	3	1 1/2	1 1/2	1 1/2	V	8	2 1/2	14 1/2	1 1/2	34 1/2	1 1/2	V	8 1/2	4	1/4	2	51	3	1/4	2	143 1/2	33 1/2
Denby 27-4	3	1 1/2	1 1/2	1 1/2	V	13	1 1/2	16 1/2	1 1/2	38 1/2	1 1/2	F	8 1/2	4	1/4	2	58	2 1/2	1/4	2	140	34
Denby 210-5	3	1 1/2	1 1/2	1 1/2	V	13	1 1/2	16 1/2	1 1/2	38 1/2	1 1/2	F	8 1/2	4	1/4	2	58	2 1/2	1/4	2	140	34
Dependable Dispatch A-1 1/2	4	1 1/2	1 1/2	1 1/2	V	14	2 1/2	15	1 1/2	37 1/2	2 1/2	F	53 1/2	2 1/2	1/4	1	38 1/2	2 1/2	1/4	1	108	33 1/2
Dependable C-2	4	1 1/2	1 1/2	1 1/2	V	14	2 1/2	15	1 1/2	37 1/2	2 1/2	F	53 1/2	2 1/2	1/4	1	38 1/2	2 1/2	1/4	1	121	33
Dependable D-2 1/2	4	1 1/2	1 1/2	1 1/2	V	10	2 1/2	11 1/2	1 1/2	37 1/2	2 1/2	F	53 1/2	2 1/2	1/4	1	38 1/2	2 1/2	1/4	1	140	33
Dependable E-3	4	1 1/2	1 1/2	1 1/2	V	10	2 1/2	11 1/2	1 1/2	37 1/2	2 1/2	F	63	2 1/2	1/4	1	49	2 1/2	1/4	1	152	33
Dependable G-3 1/2	4	1 1/2	1 1/2	1 1/2	V	13	2 1/2	13	1 1/2	37 1/2	2 1/2	F	63	2 1/2	1/4	1	49	2 1/2	1/4	1	170	33
Diamond T-O-3-1 1/2	3	1 1/2	1 1/2	1 1/2	V	9	1 1/2	6	1 1/2	35	2 1/2	F	48	2 1/2	1/4	2	33	2 1/2	1/4	2	100	24
Diamond T-FS&T-1 1/2																						

Replacement Table—Continued

Name, Model and Tonnage	ENGINE											BRAKE LINING							FRAME			
	Piston Rings		Carburetor			Upper Hose		Lower Hose		Fan Belt			Service				Emergency			Length	Width	
	No. per Cyl.	Width	Outlet Diameter	Inlet Diameter	Vertical or Horizontal	Length	Width	Length	Width	Length	Width	Type	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Gersix L-3½	4	1	1½	1½	H	13½	2	16	1½	36	2	F	56	2	1½	2	56	2	1½	2	144	36½
Giant 16-2½	3	3	1½	1½	V	7½	1½	11½	1½	36½	1½	F	13	1½	1½	8	13	1½	1½	8	140½	33
Giant 17-3½	3	3	1½	1½	V	9½	1½	12	1½	36	1½	V	15½	3½	1½	8	15½	3½	1½	8	183½	36
G.M.C. K-16	4	4	1½	1½	V	8	1½	8	1½	35	1½	V	49	2	1½	2	47	2	1½	2	89	34
G.M.C. K-20	4	4	1½	1½	V	10	1½	9½	1½	37	1½	V	49	2	1½	2	47	2	1½	2	191	33
G.M.C. K-41	4	4	1½	1½	V	10	1½	9½	1½	37	1½	V	13	3	1½	4	13	3	1½	4	Opt	33
G.M.C. K-71	4	4	1½	1½	V	11½	1½	9½	1½	37	1½	V	15½	3	1½	4	15½	3	1½	4	Opt	38
G.M.C. K-101	4	4	1½	1½	V	11½	1½	9½	1½	37	1½	V	17½	4	1½	4	17½	4	1½	4	Opt	38
Gramm-Pioneer 10 Speed-1	3	3	1	1	V	12	2	14½	2	29	1	F	48	2	2	2	26	2	2	1	97	30½
Gramm-Pioneer 15-1½-2	3	3	1	1	V	10½	2	6	2	39	1½	F	48½	2	2	2	45½	1½	1½	2	120	32
Gramm-Pioneer 65-1½-2	3	3	1	1	V	10½	2	6	2	39	1½	F	19½	1½	1½	4	19½	1½	1½	4	120	32
Gramm-Pioneer 20-2-2½	3	3	1	1	V	11	1½	12	1½	32	2	F	45	2	2	2	45	2	2	4	126	32
Gramm-Pioneer 30-3	3	3	1	1	V	11	1½	9	1½	33½	2	F	22½	2	2	2	22½	2	2	4	129½	36
Gramm-Pioneer 75P-3½	3	3	1	1	V	11	1½	9	1½	33½	2	F	22½	2	2	2	22½	2	2	4	129½	36
Gramm-Pioneer 40-4	3	3	1	1	V	11	1½	9	1½	33½	2	F	28½	2	2	2	28½	2	2	4	144	36
Gramm-Pioneer 50-5-6	3	3	1	1	V	23½	2	13½	2	40½	2	F	32M	2	2	2	32	2	2	4	132	36
G. W. W.	3	3	1	1	V	12	1½	11	1½	37	2	F	49	2	2	2	47	2	2	2	89	32
Hall 2-Worm-2½	3	3	1	1	V	8	1½	11	1½	32	1½	F	11½	3	1½	4	11½	3	1½	4	144	38
Hall 3½-Worm	3	3	1	1	V	12½	1½	15½	1½	38½	1½	F	15	3½	1½	4	15	3½	1½	4	180	39
Hall 5-Worm	3	3	1	1	V	12½	1½	15½	1½	38½	1½	F	18	4	1½	4	18	4	1½	4	144	39
Hall 7-Chain	3	3	1	1	V	12½	1½	15½	1½	38½	1½	F	18	4	1½	4	18	4	1½	4	144	39
Harvey WOA-2	4	4	2	2	V	11	2	14	1½	35	2	F	45	2	2	2	45	2	2	2	139	32
Harvey WFA-2½	4	4	2	2	V	11	2	14	1½	35	2	F	50	2	2	2	50	2	2	2	139	32
Harvey WHA-3½	4	4	2	2	V	12	2	14	1½	35½	2	F	56½	2	2	2	56½	2	2	2	108	35
Harvey WFT-6	4	4	2	2	V	11	2	14	1½	35	2	F	50	2	2	2	50	2	2	2	85	32
Harvey WHT-10	4	4	2	2	V	12	2	14	1½	35½	2	F	56½	2	2	2	56½	2	2	2	93	35
Hendrickson N-2½	3	3	1	1	V	9	2	7	2	32	1½	R	12	1½	1½	4	12	1½	1½	4	Opt	32½
Hendrickson M-3½	3	3	1	1	V	9	2	7	2	32	1½	R	18	2	2	2	18	2	2	2	Opt	36
Hendrickson K-5	3	3	1	1	V	9	2	7	2	32	1½	R	18	2	2	2	18	2	2	2	Opt	38
Higra A18-1	3	3	1	1	V	9	2	7	2	32	1½	R	12	1½	1½	4	12	1½	1½	4	85	32
Higra B20-1½	3	3	1	1	V	9	2	7	2	32	1½	R	18	2	2	2	18	2	2	2	100	32
Hurlburt A1½-2	3	3	1	1	V	9	2	7	2	32	1½	R	22	2	2	2	22	2	2	2	132	35½
Hurlburt B2½	3	3	1	1	V	9	2	7	2	32	1½	R	26	2	2	2	26	2	2	2	154	34
Hurlburt C3½-4	3	3	1	1	V	9	2	7	2	32	1½	R	24	2	2	2	24	2	2	2	144½	34
Hurlburt D5-5½	3	3	1	1	V	9	2	7	2	32	1½	R	28	3	2	2	27	3	2	2	144½	34
Huron-Erie 1½	4	4	1	1	V	17	1½	14	1½	38½	1	F	15	3	3	2	50	2	2	2	121	33
Huron-Michigan 2½	4	4	1	1	V	17	1½	14	1½	38½	1	F	15	3	3	2	50	2	2	2	145	33
Indiana 12-1½	3	3	1	1	V	6	1½	13	1½	26	1½	F	44	2	2	2	44	2	2	2	108	32
Indiana 20-2	3	3	1	1	V	6	1½	13	1½	26	1½	F	51	2	2	2	51	2	2	2	126	33
Indiana 25-2½	3	3	1	1	V	6	1½	13	1½	26	1½	F	56	2	2	2	56	2	2	2	138	33
Indiana 35-3½	3	3	1	1	V	10	1½	17½	2	30½	1½	F	68	3	2	2	68	3	2	2	144	34½
Indiana 51-5	3	3	1	1	V	9½	2	17½	2	30½	1½	F	38	2	2	2	38	2	2	2	156	37
International S-2000 lbs.-Speed Tr.	3	3	1	1	V	6	1½	13	1½	26	1½	F	43	2	2	2	43	2	2	2	90	34
International 21-2000 lbs.	3	3	1	1	V	6	1½	13	1½	26	1½	F	43½	2	2	2	43½	2	2	2	75	34
International 31-3000 lbs.	3	3	1	1	V	6	1½	13	1½	26	1½	F	50	2	2	2	50	2	2	2	106½	34
International 41-4000 lbs.	3	3	1	1	V	9	2	14½	2	33½	1½	F	50	2	2	2	50	2	2	2	111	32
International 52-School Bus	4	4	1	1	V	9	2	14½	2	33½	1½	F	10½	2	2	2	50	3	2	2	217	34
International 61-6000 lbs.	4	4	1	1	V	9	2	14½	2	33½	1½	F	50	2	2	2	50	2	2	2	118	34
International 162 Tactor Truck	4	4	1	1	V	9	2	14½	2	33½	1½	F	50	2	2	2	50	2	2	2	118	34
International 101-10,000	4	4	1	1	V	9	2	14½	2	33½	1½	F	73	2	2	2	73	2	2	2	147	34
International 102 Tractor Truck	3	3	1	1	V	9	2	14½	2	33½	1½	F	73	2	2	2	73	2	2	2	147	34
Jackson B-3½	3	3	1	1	V	11	1½	14½	2	32½	1½	F	58½	3	2	2	58½	3	2	2	156	36
Kalamazoo G-1	3	3	2	2	V	15½	2	8	1½	40	1½	F	50	2	2	2	34	2	2	1	120	32½
Kalamazoo L.G.	3	3	2	2	V	6	1½	16	1½	39	1½	F	50	2	2	2	34	2	2	1	120	32½
Kalamazoo NH	3	3	2	2	V	20	1½	19½	2	42	2	F	52	2	2	2	52	2	2	1	144	33
Kalamazoo HD	3	3	2	2	V	20	1½	19½	2	42	2	F	52	2	2	2	52	2	2	1	120	33
Kalamazoo SK	3	3	2	2	V	20	1½	19½	2	42	2	F	57	2	2	2	57	2	2	1	152	36
Kalamazoo OK	3	3	2	2	V	20	1½	19½	2	42	2	F	68	3	2	2	68	3	2	2	152	36
Kearns H-1	3	3	1	1	V	16	2	16	2	33	1	F	42	2	2	2	21	2	2	2	90	34
Kearns N-2	3	3	1	1	V	18	2	18	2	33	1	F	45	2	2	2	22	2	2	2	120	34
Kelly-Springfield K34-1½	4	4	1	1	V	7	1½	13	1½	54½	1	V	17½	1½	1½	4	17½	1½	1½	4	138	34
Kelly-Springfield K35-2½	4	4	1	1	V	7	1½	13	1½													

Replacement Table—Continued

Name, Model and Tonnage	ENGINE											BRAKE LINING								FRAME		
	Piston Rings		Carburetor		Upper Hose		Lower Hose		Fan Belt			Service				Emergency				Length	Width	
	No. per Cyl.	Width	Outlet Diameter	Inlet Diameter	Vertical or Horizontal	Length	Width	Length	Width	Length	Width	Type	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Larrabee W-5-7.	4	3	1 1/2	2 1/2	V	8 1/2	2	17 1/2	2	44 1/2	2	F	72	3	1/4	2	72	3	1/4	2	152	36
Luedinghaus K2.	4	3	1 1/2	2 1/2	V	9	1 1/2	17 1/2	2	44 1/2	2	F	53.4	3	1/4	2	38 1/2	3	1/4	2	120	34
Luedinghaus K2-LS.	4	3	1 1/2	2 1/2	V	9	1 1/2	17 1/2	2	44 1/2	2	F	53.4	3	1/4	2	38 1/2	3	1/4	2	145 1/2	34
Maccar L.	4	3	1 1/2	2 1/2	V	9 1/2	1 1/2	17 1/2	2	44 1/2	2	F	53.4	3	1/4	2	38 1/2	3	1/4	2	128 1/2	34
Maccar HA.	4	4	1 1/2	2 1/2	V	11 1/2	1 1/2	17 1/2	2	44 1/2	2	F	53.4	3	1/4	2	38 1/2	3	1/4	2	143 1/2	34
Maccar H 2.	4	4	1 1/2	2 1/2	V	9 1/2	1 1/2	17 1/2	2	44 1/2	2	F	53.4	3	1/4	2	38 1/2	3	1/4	2	141 1/2	34
Maccar M-3.	4	4	1 1/2	2 1/2	V	11 1/2	1 1/2	17 1/2	2	44 1/2	2	F	53.4	3	1/4	2	38 1/2	3	1/4	2	155 1/2	34
Maccar G.	4	4	1 1/2	2 1/2	V	10 1/2	2	20 1/2	2	40 1/2	2	F	18	4	1/4	4	18	4	1/4	4	166 1/2	37 1/2
MacDonald A-7 1/2.	4	4	1 1/2	2 1/2	V	12	2	21	1 1/2	35	2	F	70	3	1/4	1	34	3	1/4	1	Opt	33 1/2
Mack AB-1 1/2, 2, 2 1/2-Ton-Chain.	3	3	1 1/2	2 1/2	V	7 1/2	1 1/2	5 1/2	1 1/2	36 1/2	1 1/2	F	12 1/2	4	1/4	2	16 1/2	3	1/4	2	Opt	33 1/2
Mack Dual Reduction-1 1/2-2 1/2.	3	3	1 1/2	2 1/2	V	7 1/2	1 1/2	5 1/2	1 1/2	36 1/2	1 1/2	F	12 1/2	4	1/4	2	16 1/2	3	1/4	2	Opt	33 1/2
Mack AB-Tractor 5 Ton.	3	3	1 1/2	2 1/2	V	7 1/2	1 1/2	5 1/2	1 1/2	36 1/2	1 1/2	F	12 1/2	4	1/4	2	16 1/2	3	1/4	2	Opt	33 1/2
Mack AC-3 1/2 to 7 1/2 Ton.	3	3	1 1/2	2 1/2	V	5 1/2	2 1/2	3 1/2	2	36 1/2	1 1/2	F	16 1/2	3	1/4	4	20 1/2	3 1/2	1/4	4	Opt	37 1/2
Mack AC-Tractor 7 to 15 Ton.	3	3	1 1/2	2 1/2	V	5 1/2	2 1/2	3 1/2	2	36 1/2	1 1/2	F	16 1/2	3	1/4	4	20 1/2	3 1/2	1/4	4	Opt	37 1/2
Master JI-1 1/2.	4	4	1 1/2	2 1/2	H	13 1/2	2	12 1/2	1 1/2	30 1/2	1	F	72	3	1/4	1	72	3	1/4	1	117 1/2	34
Master JW-1 1/2.	4	4	1 1/2	2 1/2	V	13 1/2	2	12 1/2	1 1/2	30 1/2	1	F	72	3	1/4	2	72	3	1/4	2	Opt	34 1/2
Master JD.	4	4	1 1/2	2 1/2	V	13 1/2	2	12 1/2	1 1/2	30 1/2	1	F	72	3	1/4	2	72	3	1/4	2	Opt	34 1/2
Master M-2 1/2.	4	4	1 1/2	2 1/2	V	13 1/2	2	12 1/2	1 1/2	33	1 1/2	F	74	3	1/4	2	74	3	1/4	2	117 1/2	34
Master O 2 1/2.	4	4	1 1/2	2 1/2	V	13 1/2	2	12 1/2	1 1/2	33	1 1/2	F	75 1/2	3	1/4	1	74 1/2	3	1/4	1	156 1/2	34
Master W-2 1/2.	4	4	1 1/2	2 1/2	V	13 1/2	2	12 1/2	1 1/2	31	1 1/2	F	13 1/2	3 1/2	1/4	2	13 1/2	3 1/2	1/4	2	117 1/2	34
Master WL-2 1/2.	4	4	1 1/2	2 1/2	V	13 1/2	2	12 1/2	1 1/2	31	1 1/2	F	13 1/2	3 1/2	1/4	2	13 1/2	3 1/2	1/4	2	156 1/2	34
Master D-2 1/2.	4	4	1 1/2	2 1/2	V	13 1/2	2	12 1/2	1 1/2	35	1 1/2	F	8 1/2	4 1/2	1/4	2	54 1/2	3	1/4	2	117 1/2	34
Master DL-2 1/2.	4	4	1 1/2	2 1/2	V	13 1/2	2	12 1/2	1 1/2	35	1 1/2	F	8 1/2	4 1/2	1/4	2	54 1/2	3	1/4	2	156 1/2	34
Master DD-2 1/2.	4	4	1 1/2	2 1/2	V	13 1/2	2	12 1/2	1 1/2	35	1 1/2	F	8 1/2	4 1/2	1/4	2	56 1/2	3	1/4	2	Opt	34 1/2
Master T-6 Tractor.	4	4	1 1/2	2 1/2	V	13 1/2	2	12 1/2	1 1/2	33	1 1/2	F	74 1/2	3	1/4	1	74 1/2	3	1/4	1	72 1/2	34
Master A-3 1/2.	4	4	1 1/2	2 1/2	V	13 1/2	2	15	1 1/2	35	2	F	16	3 1/2	1/4	2	16	3 1/2	1/4	2	147 1/2	36 1/2
Master AL-3 1/2.	4	4	1 1/2	2 1/2	V	13 1/2	2	15	1 1/2	35	2	F	16	3 1/2	1/4	2	16	3 1/2	1/4	2	183 1/2	36 1/2
Master E-3 1/2.	4	4	1 1/2	2 1/2	V	13 1/2	2	15	1 1/2	35	2	F	13 1/2	6	1/4	2	23	4	1/4	4	147 1/2	36 1/2
Master Y-4.	4	4	1 1/2	2 1/2	V	13 1/2	2	15	1 1/2	35	2	F	13 1/2	6	1/4	2	23	4	1/4	4	Opt	36 1/2
Master EL-3 1/2.	4	4	1 1/2	2 1/2	V	13 1/2	2	15	1 1/2	35	2	F	13 1/2	6	1/4	2	23	4	1/4	4	183 1/2	36 1/2
Master B-5.	4	4	1 1/2	2 1/2	V	13 1/2	2	15	1 1/2	37	2	F	13 1/2	4	1/4	2	18	4	1/4	2	162 1/2	39
Master BL-5.	4	4	1 1/2	2 1/2	V	13 1/2	2	15	1 1/2	37	2	F	13 1/2	4	1/4	2	18	4	1/4	2	186 1/2	39
Master F-5.	4	4	1 1/2	2 1/2	V	13 1/2	2	15	1 1/2	37	2	F	13 1/2	4	1/4	2	23	4	1/4	4	162 1/2	39
Master FL-5.	4	4	1 1/2	2 1/2	V	13 1/2	2	15	1 1/2	37	2	F	13 1/2	6	1/4	2	23	4	1/4	4	186 1/2	39
Master DDT-6.	4	4	1 1/2	2 1/2	V	13 1/2	2	12 1/2	1 1/2	35	1 1/2	F	8 1/2	4 1/2	1/4	2	56 1/2	3	1/4	2	Opt	34 1/2
Master DT-6 Tractor.	4	4	1 1/2	2 1/2	V	13 1/2	2	12 1/2	1 1/2	35	1 1/2	F	8 1/2	4 1/2	1/4	2	54	3	1/4	2	72 1/2	43
Maxwell 1 1/2.	3	3	1 1/2	2 1/2	V	6 1/2	1 1/2	7 1/2	1 1/2	44 1/2	1 1/2	F	16	1 1/2	1/4	4	11	1 1/2	1/4	4	102	36
Menominee Hurryton-1.	3	3	1 1/2	2 1/2	V	6 1/2	1 1/2	12	1 1/2	40	1 1/2	F	11	2 1/2	1/4	4	11	2 1/2	1/4	4	102 1/2	33
Menominee H-1 1/2.	3	3	1 1/2	2 1/2	V	3	1 1/2	3	1 1/2	37 1/2	2	F	13 1/2	3 1/2	1/4	8	42 1/2	2 1/2	1/4	2	146	32
Menominee D-2.	3	3	1 1/2	2 1/2	V	3	1 1/2	3	1 1/2	37 1/2	2	F	13 1/2	3 1/2	1/4	8	42 1/2	2 1/2	1/4	2	102 1/2	32
Menominee HT-1 1/2.	3	3	1 1/2	2 1/2	V	9 1/2	1 1/2	10 1/2	1 1/2	33 1/2	1 1/2	F	47 1/2	2 1/2	1/4	2	33 1/2	2 1/2	1/4	2	149	38
Menominee J-5.	3	3	1 1/2	2 1/2	V	3	1 1/2	3	1 1/2	40 1/2	1 1/2	F	69	3 1/2	1/4	2	52	2 1/2	1/4	2	149	38
Menominee G-3 1/2.	3	3	1 1/2	2 1/2	V	3	1 1/2	3	1 1/2	37 1/2	2	F	15 1/2	3 1/2	1/4	4	15 1/2	3 1/2	1/4	4	149	36
Moline 10.	3	3	1 1/2	2 1/2	H	10 1/2	4 1/2	2 1/2	2	21	2 1/2	F	21	2 1/2	1/4	2	20	2 1/2	1/4	2	108	32
Moreland BX-1 1/2.	3	3	1 1/2	2 1/2	H	8	1 1/2	11 1/2	1 1/2	42	1 1/2	F	12	3 1/2	1/4	4	12	3 1/2	1/4	4	108	34
Moreland EX-2.	3	3	1 1/2	2 1/2	H	9	1 1/2	13	1 1/2	42	1 1/2	F	12	3 1/2	1/4	4	12	3 1/2	1/4	4	132	34
Moreland AX-3.	3	3	1 1/2	2 1/2	H	9	1 1/2	13	1 1/2	42	1 1/2	F	13 1/2	3 1/2	1/4	4	13 1/2	3 1/2	1/4	4	174	38
Moreland RX-5.	3	3	1 1/2	2 1/2	H	9 1/2	1 1/2	19	1 1/2	42	1 1/2	F	16	3 1/2	1/4	4	16	3 1/2	1/4	4	192	38
Napoleon 9-1.	3	3	1 1/2	2 1/2	H	6 1/2	2 1/2	14	2 1/2	39	1	F	21	4	1/4	1	30	2 1/2	1/4	1	100 1/2	35 1/2
Napoleon 11-1 1/2.	3	3	1 1/2	2 1/2	H	6 1/2	2 1/2	14	2 1/2	39	1	F	21	4	1/4	1	30	2 1/2	1/4	1	100 1/2	35 1/2
Nash 2018-1-1 1/2.	4	4	1 1/2	2 1/2	H	3	1 1/2	7 1/2	1 1/2	36	1	F	49 1/2	3	1/4	2	20	2 1/2	1/4	1	104 1/2	30 1/2
Nash 3018-1																						

Replacement Table—Continued

Name, Model and Tonnage	ENGINE										BRAKE LINING				FRAME								
	Piston Rings		Carburetor		Upper Hose		Lower Hose		Fan Belt		Service		Emergency		Length	Width							
	No. per Cyl.	Width	Outlet Diameter	Inlet Diameter	Vertical or Horizontal	Length	Width	Length	Width	Length	Width	Type	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All	
Parker J20-3 1/2	3	1 1/2	1 1/2	1 1/2	V	19	1 1/2	16 1/2	1 1/2	38	2	F	10 3/4	5	1 1/2	2	2	10	3 1/2	1 1/2	4	139 1/2	33
Parker M20-5	3	1 1/2	1 1/2	1 1/2	H	14	1 1/2	18	1 1/2	40 1/2	2	F	10 3/4	5	1 1/2	2	2	24 1/2	4	1 1/2	1	145	37
Patriot Revere-1	3	1 1/2	1 1/2	1 1/2	V	8	1 1/2	9	1 1/2	37	1 1/2	F	40 1/2	1 1/2	1 1/2	1	1	40 1/2	1 1/2	1 1/2	1	93	66
Patriot Lincoln Special-2	3	1 1/2	1 1/2	1 1/2	V	11	1 1/2	10	1 1/2	39	2	F	40 1/2	1 1/2	1 1/2	1	1	40 1/2	1 1/2	1 1/2	1	113	67 1/2
Patriot Washington Special-3	3	1 1/2	1 1/2	1 1/2	V	11	1 1/2	10	1 1/2	39	2	F	58	2 1/2	2 1/2	1	1	22 1/2	2 1/2	2 1/2	1	150	67 1/2
Pierce Arrow-2-X-5	3	1 1/2	1 1/2	1 1/2	V	16 1/2	2 1/2	14 1/2	2 1/2	43 1/2	1 1/2	F	9 1/2	6	1 1/2	1	4	22 1/2	2 1/2	2 1/2	4	125 1/2	38 1/2
Pierce Arrow-3 1/2-W-2	3	1 1/2	1 1/2	1 1/2	V	11	1 1/2	15 1/2	1 1/2	43 1/2	1 1/2	F	14	1 1/2	1 1/2	1	4	18	1 1/2	1 1/2	4	133 1/2	38 1/2
Pierce Arrow-5-R-10	3	1 1/2	1 1/2	1 1/2	V	13	1 1/2	12	1 1/2	37	1	F	52	2 1/2	2 1/2	1	2	13	1 1/2	1 1/2	4	102	30
Pioneer 59AA-1	3	1 1/2	1 1/2	1 1/2	V	5	1 1/2	13	1 1/2	31 1/2	1 1/2	F	44 1/2	2 1/2	2 1/2	1	2	52	2 1/2	2 1/2	2	136	33
Pittsburgher 2 1/2	3	1 1/2	1 1/2	1 1/2	V	5	1 1/2	13	1 1/2	41	1 1/2	F	19	2	2	1	2	19	2	2	2	113	34
Rainier R-8-2	3	1 1/2	1 1/2	1 1/2	V	9 1/2	1 1/2	14 1/2	1 1/2	41	1 1/2	F	19	2	2	1	2	19	2	2	2	100	34
Rainier R6-1 1/2	3	1 1/2	1 1/2	1 1/2	V	9	1 1/2	14	1 1/2	41	1 1/2	F	11 1/2	3	3 1/2	1	2	11 1/2	3	3	2	90	34
Rainier R-19-1	3	1 1/2	1 1/2	1 1/2	V	10	1 1/2	14 1/2	1 1/2	42	1 1/2	F	11 1/2	3	3 1/2	1	2	11 1/2	3	3	2	106 1/2	33
Rainier R-11-3/4	3	1 1/2	1 1/2	1 1/2	H	11 1/2	1 1/2	10	1 1/2	35	2	F	17	2	2	1	4	17	2	2	1	122	32
Ranger TK-20-2	3	1 1/2	1 1/2	1 1/2	V	10 1/2	1 1/2	13 1/2	1 1/2	35	2	F	17	2	2	1	4	17	2	2	1	127	32
Reliance 10A-1 1/2	4	1 1/2	1 1/2	1 1/2	V	10 1/2	2	13 1/2	1 1/2	39	7/8	F	43	2 1/2	2 1/2	1	4	39 1/2	2 1/2	2 1/2	4	82	30
Reliance 20B-2 1/2	3	1 1/2	1 1/2	1 1/2	V	5 1/2	1 1/2	5 1/2	1 1/2	40 1/2	1 1/2	F	21 1/2	2 1/2	2 1/2	1	2	19 1/2	2 1/2	2 1/2	2	34	34
Reo F-1500-2500 lbs.	3	1 1/2	1 1/2	1 1/2	V	12 1/2	2	6	2	40	1 1/2	F	25 1/2	2 1/2	2 1/2	1	2	24 1/2	2 1/2	2 1/2	2	118	34
Republic 10-1-10E-1	3	1 1/2	1 1/2	1 1/2	V	12 1/2	2	6	2	40	1 1/2	F	25 1/2	2 1/2	2 1/2	1	2	24 1/2	2 1/2	2 1/2	2	121	34
Republic 11X-1 1/2	3	1 1/2	1 1/2	1 1/2	V	8	1 1/2	11 1/2	1 1/2	36 1/2	1 1/2	F	55 1/2	3 1/2	3 1/2	1	4	30 1/2	4 1/2	4 1/2	1	146	37
Republic 19-2 1/2	3	1 1/2	1 1/2	1 1/2	V	7 1/2	1 1/2	11 1/2	1 1/2	31 1/2	1	F	19	2	2	1	4	19	2	2	4	95	31
Republic 20-3 1/2	3	1 1/2	1 1/2	1 1/2	V	12	2 1/2	18 1/2	2 1/2	32 1/2	1 1/2	F	19	2	2	1	4	19	2	2	4	113	33
Republic Rapid Transit-3/4	3	1 1/2	1 1/2	1 1/2	V	10 1/2	1 1/2	13 1/2	1 1/2	32 1/2	1 1/2	F	45	2 1/2	2 1/2	1	4	45	2 1/2	2 1/2	4	123	33
Rowe CW-1 1/2	3	1 1/2	1 1/2	1 1/2	V	10 1/2	1 1/2	10 1/2	1 1/2	32 1/2	1 1/2	F	51 1/2	2 1/2	2 1/2	1	4	51 1/2	2 1/2	2 1/2	4	140	33
Rowe CDW-2	3	1 1/2	1 1/2	1 1/2	V	20	1 1/2	15 1/2	1 1/2	36 1/2	2	F	51 1/2	2 1/2	2 1/2	1	4	51 1/2	2 1/2	2 1/2	4	146	36
Rowe CDW-2 1/2	3	1 1/2	1 1/2	1 1/2	V	20	1 1/2	15 1/2	1 1/2	36 1/2	2	F	56 1/2	2 1/2	2 1/2	1	4	56 1/2	2 1/2	2 1/2	4	153	35 1/2
Rowe GSW-3	3	1 1/2	1 1/2	1 1/2	V	20	1 1/2	15 1/2	1 1/2	36 1/2	2	F	68	3	3	1	4	68	3	3	4	152	38
Rowe HW-4	3	1 1/2	1 1/2	1 1/2	V	20	1 1/2	15 1/2	1 1/2	36 1/2	2	F	68	3	3	1	4	68	3	3	4	152	38
Rowe FW-5	3	1 1/2	1 1/2	1 1/2	V	10 1/2	1 1/2	10 1/2	1 1/2	37	2	F	18	2	2	1	4	18	2	2	1	108 1/2	39 1/2
Rowe GPW-3	3	1 1/2	1 1/2	1 1/2	V	10 1/2	1 1/2	10 1/2	1 1/2	37	2	F	37	2	2	1	4	37	2	2	1	108 1/2	39 1/2
Rumely A-1 1/2	4	1 1/2	1 1/2	1 1/2	V	6 1/2	1 1/2	7 1/2	1 1/2	37	1 1/2	F	43 1/2	2 1/2	2 1/2	1	4	37	2	2	1	120	32
Samson 15-3/4	3	1 1/2	1 1/2	1 1/2	V	6 1/2	1 1/2	7 1/2	1 1/2	40	1 1/2	V	22 1/2	2 1/2	2 1/2	1	4	22 1/2	2 1/2	2 1/2	2	144	35
Samson 25-1 1/2	3	1 1/2	1 1/2	1 1/2	H	6 1/2	1 1/2	7 1/2	1 1/2	32	1 1/2	V	22 1/2	2 1/2	2 1/2	1	4	22 1/2	2 1/2	2 1/2	2	144	35
Sanford W15-1 1/2	3	1 1/2	1 1/2	1 1/2	V	11	1 1/2	14	1 1/2	37 1/2	2	F	55 1/2	2 1/2	2 1/2	1	4	65	2	2	2	144	35
Sanford 25-2 1/2	3	1 1/2	1 1/2	1 1/2	V	11	1 1/2	14	1 1/2	32	1 1/2	F	65	2	2	1	4	65	2	2	2	140	35 1/2
Sanford 35-3 1/2	3	1 1/2	1 1/2	1 1/2	V	11	1 1/2	14	1 1/2	37 1/2	2	F	8 1/2	3	3	1	4	8 1/2	3	3	1	140	35 1/2
Sanford 50-5	4	1 1/2	1 1/2	1 1/2	H	11	2	14	1 1/2	37 1/2	2	F	8 1/2	3	3	1	4	8 1/2	3	3	1	152	35 1/2
Schacht F-2	4	1 1/2	1 1/2	1 1/2	H	10 1/2	2	13 1/2	1 1/2	39 1/2	1 1/2	V	8 1/2	3	3	1	4	15	4	4	4	152	35 1/2
Schacht F-3	4	1 1/2	1 1/2	1 1/2	H	10 1/2	2	13 1/2	1 1/2	39 1/2	1 1/2	V	8 1/2	3	3	1	4	15	4	4	4	152	35 1/2
Schacht E-4	4	1 1/2	1 1/2	1 1/2	H	10 1/2	2	13 1/2	1 1/2	39 1/2	1 1/2	V	8 1/2	3	3	1	4	15	4	4	4	152	35 1/2
Schacht E-5	4	1 1/2	1 1/2	1 1/2	H	10 1/2	2	13 1/2	1 1/2	39 1/2	1 1/2	V	15 1/2	1 1/2	1 1/2	1	4	15 1/2	1 1/2	1 1/2	4	120	34
Schacht E-7	4	1 1/2	1 1/2	1 1/2	H	9 1/2	2 1/2	13	2 1/2	29 1/2	20 1/2	F	20 1/2	2 1/2	2 1/2	1	4	51 1/2	2 1/2	2 1/2	4	36	36
Schwartz A-1	3	1 1/2	1 1/2	1 1/2	V	10	1 1/2	18	1 1/2	33 1/2	2	F	51 1/2	2 1/2	2 1/2	1	4	51 1/2	2 1/2	2 1/2	4	114	34
Schwartz K-2	3	1 1/2	1 1/2	1 1/2	V	10	1 1/2	15	1 1/2	33 1/2	2	F	69 1/2	3	3	1	4	11 1/2	3 1/2	3 1/2	4	134	34
Schwartz LS-L-LL-3	3	1 1/2	1 1/2	1 1/2	H	12 1/2	2 1/2	17	1 1/2	41	1 1/2	F	11 1/2	3 1/2	3 1/2	1	4	13	3 1/2	3 1/2	4	176	34 1/2
Schwartz MS-M-ML-5	3	1 1/2	1 1/2	1 1/2	V	12	2 1/2	12	1 1/2	31	1 1/2	F	13	3 1/2	3 1/2	1	4	13	3 1/2	3 1/2	4	153	37 1/2
Selden Unit 30	3	1 1/2	1 1/2	1 1/2	V	3 1/2	1 1/2	12	1 1/2	31	1 1/2	F	13										

Replacement Table—Continued

Name, Model and Tonnage	ENGINE										BRAKE LINING				FRAME							
	Piston Rings		Carburetor		Upper Hose		Lower Hose		Fan Belt		Service		Emergency		Length	Width						
	No. per Cyl.	Width	Outlet Diameter	Inlet Diameter	Vertical or Horizontal	Length	Width	Length	Width	Length	Width	Type	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Titan 3 1/2	4	4	1 1/2	1 1/2									60	2 1/4	1/2	2	14	4 1/2	1/2	2	144	34
Titan 5-6	4	4	1 1/2	1 1/2									54	2 1/4	1/2	2	14	4 1/2	1/2	2	144	34
Titan 2 1/2	4	4	1 1/2	1 1/2									54	2 1/4	1/2	2	14	4 1/2	1/2	2	144	34
Tower J-1 1/2	3	3	1 1/2	1 1/2									13 1/2	3 1/2	1/2	2	14	4 1/2	1/2	2	135 1/2	37
Tower H-2 1/2	3	3	1 1/2	1 1/2									15 1/2	3 1/2	1/2	2	14	4 1/2	1/2	2	138 1/2	43
Tower G-3 1/2	3	3	1 1/2	1 1/2									43 1/2	2 1/2	1/2	2	14	4 1/2	1/2	2	120 1/2	34
Traffic C-4000	3	3	1 1/2	1 1/2									52	3	1/2	2	14	4 1/2	1/2	2	86	34
Traffic 6000	3	3	1 1/2	1 1/2									43 1/2	2 1/2	1/2	2	14	4 1/2	1/2	2	98 1/2	34
Traffic Speedboy	3	3	1 1/2	1 1/2									48	2 1/2	1/2	2	14	4 1/2	1/2	2	100 7/8	34
Transport 15-1	3	3	1 1/2	1 1/2									11	3	1/2	2	14	4 1/2	1/2	2	116 1/2	34
Transport 25-1 1/2	3	3	1 1/2	1 1/2									10 1/2	3 1/2	1/2	2	14	4 1/2	1/2	2	123 1/2	34
Transport 35-2	4	4	1 1/2	1 1/2									11 1/2	3 1/2	1/2	2	14	4 1/2	1/2	2	150 1/2	34
Transport 60-3 1/2	4	4	1 1/2	1 1/2									50	2	1/2	2	14	4 1/2	1/2	2	122	34
Transport 75-5	3	3	1 1/2	1 1/2									50	2	1/2	2	14	4 1/2	1/2	2	142	34
Transport 55-3	4	4	1 1/2	1 1/2									56 1/2	2 1/2	1/2	2	14	4 1/2	1/2	2	165	34
Traylor B-1 1/2	4	4	1 1/2	1 1/2									36	2	1/2	2	14	4 1/2	1/2	2	94	34
Traylor C-2 1/2	4	4	1 1/2	1 1/2									36	2	1/2	2	14	4 1/2	1/2	2	126	34
Traylor D-3 3/4	4	4	1 1/2	1 1/2									37	2	1/2	2	14	4 1/2	1/2	2	132	34
Traylor F-5-6	3	3	1 1/2	1 1/2									34	1 1/2	1/2	2	14	4 1/2	1/2	2	129	34
Triangle AA-1	3	3	1 1/2	1 1/2									7	4	1/2	2	14	4 1/2	1/2	2	120	34
Triangle A-1 1/2	3	3	1 1/2	1 1/2									7	4	1/2	2	14	4 1/2	1/2	2	120	34
Triangle B-2 1/2	3	3	1 1/2	1 1/2									46	2 1/2	1/2	2	14	4 1/2	1/2	2	126	34
Triangle C-2	4	4	1 1/2	1 1/2									46	2 1/2	1/2	2	14	4 1/2	1/2	2	126	34
Triumph HB-2 1/2	4	4	1 1/2	1 1/2									20	2 1/2	1/2	2	14	4 1/2	1/2	2	150	34
Triumph HC-2	4	4	1 1/2	1 1/2									20	2 1/2	1/2	2	14	4 1/2	1/2	2	144	34
Ultimate A-2	4	4	1 1/2	1 1/2									51	2 1/2	1/2	2	14	4 1/2	1/2	2	192	34
Ultimate AJ2	4	4	1 1/2	1 1/2									51	2 1/2	1/2	2	14	4 1/2	1/2	2	180	34
Ultimate AJL-2	4	4	1 1/2	1 1/2									51	2 1/2	1/2	2	14	4 1/2	1/2	2	133 1/2	34
Ultimate B-3	4	4	1 1/2	1 1/2									55	3	1/2	2	14	4 1/2	1/2	2	157 1/2	34
Ultimate BL3	4	4	1 1/2	1 1/2									26	4 1/2	1/2	2	14	4 1/2	1/2	2	190	34
Ultimate D-5	3	3	1 1/2	1 1/2									56 1/2	3 1/2	1/2	2	14	4 1/2	1/2	2	157 1/2	34
Union F-2 1/2	3	3	1 1/2	1 1/2									34	4	1/2	2	14	4 1/2	1/2	2	120	34
Union FW-2 1/2	3	3	1 1/2	1 1/2									48	4	1/2	2	14	4 1/2	1/2	2	Opt	34
Union H-4	3	3	1 1/2	1 1/2									49	3	1/2	2	14	4 1/2	1/2	2	Opt	34
Union HW-4	4	4	1 1/2	1 1/2									62	3	1/2	2	14	4 1/2	1/2	2	Opt	34
Union JW-6	4	4	1 1/2	1 1/2									82 1/2	2 1/2	1/2	2	14	4 1/2	1/2	2	120	34
United 1 1/2	4	4	1 1/2	1 1/2									19 1/2	2	1/2	2	14	4 1/2	1/2	2	144	34
United 2 1/2	4	4	1 1/2	1 1/2									21	2 1/2	1/2	2	14	4 1/2	1/2	2	156	34
United 3 1/2	4	4	1 1/2	1 1/2									50	3	1/2	2	14	4 1/2	1/2	2	168	34
United 5	3	3	1 1/2	1 1/2									33	4	1/2	2	14	4 1/2	1/2	2	108	34
U.S.N.-1 1/2	3	3	1 1/2	1 1/2									50 1/2	2 1/2	1/2	2	14	4 1/2	1/2	2	120	34
U.S.N.W.-1 1/2	3	3	1 1/2	1 1/2									54 1/2	2 1/2	1/2	2	14	4 1/2	1/2	2	90	34
U.S.R.-2 1/2-3	3	3	1 1/2	1 1/2									48	2 1/2	1/2	2	14	4 1/2	1/2	2	140	34
U.S.S.-3 1/2	4	4	1 1/2	1 1/2									53 1/2	3	1/2	2	14	4 1/2	1/2	2	162	34
U.S.T.-5-6	3	3	1 1/2	1 1/2									53 1/2	3	1/2	2	14	4 1/2	1/2	2	99	34
U.S.U.-1 1/2	3	3	1 1/2	1 1/2									48	2 1/2	1/2	2	14	4 1/2	1/2	2	120	34
Velie 46-1 1/2	3	3	1 1/2	1 1/2									43	2 1/2	1/2	2	14	4 1/2	1/2	2	140	34
Velie 53-2 1/2	3	3	1 1/2	1 1/2									53 1/2	3	1/2	2	14	4 1/2	1/2	2	162	34
Vim 50-1 1/2-3/4	3	3	1 1/2	1 1/2									53 1/2	3	1/2	2	14	4 1/2	1/2	2	99	34
Walker M2	3	3	1 1/2	1 1/2									45 1/2	3	1/2	2	14	4 1/2	1/2	2	117	34
Walker P3 1/2	3	3	1 1/2	1 1/2									12	3 1/2	1/2	2	14	4 1/2	1/2	2	133	34
Walker N5	3	3	1 1/2	1 1/2									13	3 1/2	1/2	2	14	4 1/2	1/2	2	150	34
Walker 22	3	3	1 1/2	1 1/2									15	5	1/2	2	14	4 1/2	1/2	2	170	34
Walker 42	3	3	1 1/2	1 1/2									13	3 1/2	1/2	2	14	4 1/2	1/2	2	170	34
Walker Johnson A-2	4	4	1 1/2	1 1/2									15 1/2	3 1/2	1/2	2	14	4 1/2	1/2	2	90	34
Walker Johnson B3	3	3	1 1/2	1 1/2									18	4	1/2	2	14	4 1/2	1/2	2	147	34
Walter S-5	3	3	1 1/2	1 1/2									62	2 1/2	1/2	2	14	4 1/2	1/2	2	127	34
Ward LaFrance 2B-2 1/2-3 1/2	3	3	1 1/2	1 1/2									15 1/2	3 1/2	1/2	2	14	4 1/2	1/2	2	126	34
Ward LaFrance 4A-3 1/2-5	3	3	1 1/2	1 1/2									49	2	1/2	2	14	4 1/2	1/2	2	130	34
Ward LaFrance 5A-5-7	3	3	1 1/2	1 1/2									54	2 1/2	1/2	2	14	4 1/2	1/2	2	152	34
Watson C-1	3	3	1 1/2	1 1/2									66	3	1/2	2	14	4 1/2	1/2	2	163	34
Watson N-3 1/2	3	3	1 1/2	1 1/2							</											

KEY OF ABBREVIATIONS

Note: Numerals on This Page Correspond With Numerals at Head of Specification Columns on Page Following. In All Specifications—O, Own; Op or Opt, Optional

Engine:

Beav—Beaver
Buda
Cont—Continental
GBS—Golden, Belknap &
Gr-B—Gray-Beal [Swartz
Her—Hercules
Hin—Hinkley
H-Sp—Herschell-Spillman
LeR—Le Roi
Lib—Liberty
LMF—Light Mfg. & Fdy.
Lyco—Lycoming
Mid—Midwest
Sup—Supreme
Wau—Waukesha
Wei—Weidely
Wis—Wisconsin

Valve Arrangement:

H—Overhead
L—ELL—Head
S—Sleeve
T—TEE—Head

How Cooled:

A—Air
B—Pump & Thermo
C—Centrifugal
G—Gear Pump
T—Thermo-Syphon

Radiator (Make):

BW—B & W
Brm—Brenem
Bus—Bush
Can—Candler
Chic—Chicago
Eag—Eagle
EM—English-Mersick
Eur—Eureka
Fed—Fedders
Flex—Flexo
GO—G. & O.
Har—Harrison
Hoo—Hooven
Idl—Ideal
Jam—Jamestown
Kue—Kuenz
Liv—Livingston
Lng—Long
McC—McCord
May—Mayo
Mod—Modine
Per—Perfex
R-T—Rome-Turney
Spar—Sparton
Spec—Special
Spli—Splitex
Stn—Standard
Whe—Wheeler

Radiator (Type):

C—Cellular
Fin—Fin Tube
H—Honeycomb
PT—Plain Tube
ZZT—Zig Zag Tube

Lubrication:

FS—Force and Splash
F—Force Feed
S—Splash

Carburetor:

Bent—Bennett
Cart—Carter
Eag—Eagle
Ens—Ensign
John—Johnson
King—Kingston

Mar—Marvel
Mas—Master
Mill—Miller
Rayf—Rayfield
Scoe—Scoe
Strm—Stromberg
Sheb—Schebler
Stew—Stewart
Till—Tillotson
Zen—Zenith

Fuel Feed:

G—Gravity
P—Pressure
V—Vacuum

Governor:

Con—Continental
Dup—Duplex
Her—Hercules
Hin—Hinkley
McC—McCanna
Mon—Monarch
Phar—Pharo
Pier—Pierce
Sim—Simplex
Wau—Waukesha

Clutch (Make):

B-B—Borg & Beck
B-Li—Brown-Lipe
Covt—Covert
Det—Detlaff
DG—Detroit Gear & Mach.
Full—Fuller
Hart—Hartford
Hoos—Hoosier
HS—Hele-Shaw
M-E—Merchant & Evans
Mun—Muncie
T-D—Twin Disc
W-Gr—Warner Gear

Clutch (Type):

C—Cone
D—Disc
DD—Dry Disc
Fr—Friction
WP—Wet Plate

Ignition System:

ABo—American Bosch
Amr—American Swiss
Apo—Apollo
AtK—Atwater Kent
AuL—Auto-Lite
Ber—Berling
Con—Connecticut
Del—Delco
Eis—Eisemann
Kin—Kingston
KW—K. W. Ignition Co.
Lor—Lorraine
NE—North East
POL—Prest-O-Lite
Rm—Remy
RBo—Robert Bosch
Sim—Simms
Spl—Splitdorf
Tea—Teagle
Wag—Wagner
Wes—Westinghouse

Engine Starter:

AC—Allis-Chalmers
AK—Atwater Kent
ABo—American Bosch
AL—Auto-Lite
Bj—Bijur
DL—Delco
Dy—Dyneto
GD—Gray & Davis

LN—Leece-Neville
NE—North East
Rm—Remy
USL—U. S. L.
W—Westinghouse
Wg—Wagner

Gearset:

B-Li—Brown-Lipe
Cott—Cotta
Covt—Covert
Det—Detroit
Dun—Dundore
Durs—Durstun
Full—Fuller
G-Le—Grant Lees
MM—Mechanics Mach. Co.
Mun—Muncie
W-C—Warner Corporation
W-Gr—Warner Gear

Location of Gearset:

A—Amidships
J—Unit with jackshaft
R—Rear
U—Unit with engine

Universal:

Acm—Acme
Arv—Arvac
Bld—Blood-Brothers
Det—Detroit
Hart—Hartford
KB—Kinsler-Bennett
MM—Mechanics
M-E—Merchant & Evans
Nor—Norwalk
Pet—Peters
Sned—Snead
Spic—Spicer
Ster—Sterling
Ther—Thermoid
UM—Universal Machine
UP—Universal Products
Var—Varied

Springs:

Am—Am. Auto Parts
Arm—Armstrong
Cham—Champion
Del—Delany
Det—Detroit
GC—Garden City
Har—Harvey
IC—Iron City
Kal—Kalamazoo
Lah—Laher
Lig—Liggett
Mar—Maremont
Math—Mather
Mer—Merrill
Nat—National
Pen—Penn
Per—Perfection
Row—Rowland
Shel—Sheldon
SP—Spring Perch
Stan—Stan-Par
Ster—Sterling
Tut—Tuthill
US—United States
Vul—Jenkins Vulcan

Final Drive:

B—Bevel Gear
C—Chain
I—Internal Gear
P—Spur
R—Double Reduction
S—Spiral Bevel
W—Worm

Rear Axle (Make):

Badg—Badger
Col—Columbia
Clark
Dun—Dunkirk
Eat—Eaton
Fli—Flint
IrM—Iron Mt.
LM—L M Axle
Russ—Russel
Sals—Salisbury
Shel—Sheldon
Stn—Standard Parts
Thom—Thomson
Tim—Timken
Torb—Torbensen
Vul—Vulcan
Walk—Walker
Wis—Wisconsin

Rear Axle (Type):

Flot—Floating
D—Dead
½-Fl—Semi-Floating
¾-Fl—¾-Floating

Steering Gear:

CAS—C. A. S. Products Co.
Dit—Ditwiler
Gem—Gemmer
Jac—Jacox
Lav—Lavine
M-P—Muncie Products
Ros—Ross
Sag—Saginaw Products Co.
Woh—Wohlrab

Wheels:

Arc—Archibald
AuW—Auto Wheel
Bim—Bimel
Cla—Clark
C&M—Crane & McMahon
Day—Dayton
Det—Detroit
Dis—Disteel
E&O—Eberly & Oris
Hay—Hayes
Hoo—Hoopes Brothers
Imp—Imperial
Jon—Jones
Kel—Kelsey
MM—Michigan Malleable
Iron Co.
Mot—Motor Wheel
Mut—Mutual
Nor—Northern
Pru—Prudden
Roy—Royer
Sch—Schwartz
Smi—Smith
Sta—Stanwell
StM—St. Mary
Stn—Standard
Wal—Walker
Way—Wayne
W-L—Waterhouse & Lester

Rim Equipment:

Cle—Cleveland
Bak—Baker
Det—Detroit
Fir—Firestone
Gdy—Goodyear
Hay—Hayes
Jax—Jaxon
Kel—Kelsey

Commercial Car Specifications—Corrected Monthly

The Specifications, Chassis Prices, Etc., Are Corrected Each Month From Data Supplied Direct by the Makers. Gasoline Tractor-Trucks Will be Found at the End of Gasoline Commercial Cars

See Also Replacement Table in "Service and Repair Departments." Truck Frame Dimensions Are Included in Replacement Table

(Where prices are not given it is because we have been unable to get them from authoritative sources)

* An asterisk in front of the model name indicates that corrections have been made somewhere in the specifications since the previous month

Trade Name and Model	Chassis Price	ENGINE DETAILS										GEARSET		REAR AXLE		Total Gear Ratio	Total Gear Ratio in Low	Steering Gear (Make)	TIRES, WHEELS, RIMS		Rim Equipment	Chassis Weight (Stripped)	Wheelbase						
		Make and Model	Bore and Stroke	N. A. C. C.	Horsepower	Valve Arrangement	How Cooled	Radiator (Make)	Radiator (Type)	Lubrication	Carburetor	Fuel Feed	Governor (Make)	Clutch (Make)	Clutch (Type)				Ignition System	Engine Starter				Make	Type	Universal (Make)	Sprockets	Location	Speeds
1000 Pounds																													
Dort.....	685	Lycro K	3 1/2 x 5	19.6 L	18.2 L	L	T	Fed	C	S	Cart	V	.....	.....	.....	Con	LN	Col	1 1/2 F	15.13	Sag	31x4	31x4	2015	105	
Overland.....	425	Ow	3 1/2 x 4	18.2 L	18.2 L	L	T	Ow	C	F	Till	G	.....	.....	.....	Con	AL	Ow	1 1/2 F	17.68	Ow	31x4	31x4	1456	100	
1500 Pounds																													
*Brookway E2.....	650	Wis EAU	4 x 5	25.6 H	25.6 H	H	C	GO	HT	F	Strm	V	.....	.....	.....	Rm	AL	Ow	1 1/2 F	20.5	Gem	33x5	33x5	3450	135	
*Chevrolet G.....	650	Ow	3 1/2 x 4	21.7 H	21.7 H	H	C	GO	HT	F	Strm	V	.....	.....	.....	Rm	AL	Ow	1 1/2 F	16.4	M-P	31x4	31x4	2167	120	
*Clydesdale 10.....	1485	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Zen	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3100	138	
*Commerce 9.....	1150	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Zen	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3100	127	
*Corbett S Speed Truck.....	1250	H-Sp 7000	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3350	130	
*Dodge Brothers.....	1375	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	1992	114	
*Federal R-2.....	1375	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2850	132	
*H. R. L.....	2200	H-Sp 7000	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3500	134	
*Internat'l Speed Truck S.....	1250	Lycro-Int'l	3 1/2 x 5	19.6 L	19.6 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2800	124	
*Ogden A2.....	1970	Cont N	3 1/2 x 5	19.6 L	19.6 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3100	125	
*Raimor R21.....	1250	Lycro KB	3 1/2 x 5	19.6 L	19.6 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2850	124	
*Republic Rapid Transit.....	595	Ow	3 1/2 x 5	19.6 L	19.6 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2566	118	
*Samson 15.....	1095	Mid 409	3 1/2 x 4	21.8 H	21.8 H	H	C	GO	HT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2720	128	
*Service 12.....	1095	Mid 410	3 1/2 x 4	21.8 H	21.8 H	H	C	GO	HT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2720	128	
*Stoughton C.....	1465	Ow	3 1/2 x 5	25.6 L	25.6 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2480	131	
*Vim 50.....	2400	Buda MU	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2900	138	
*White 15.....	1590	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3200	133	
*Yellow Cab M-22-1/2.....	1590	Cont V-4	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2400	117	
1 Ton																													
*Acme 20.....	1750	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3050	120	
*Apex GW.....	1495	Buda MU	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2850	130	
*Atlas 22.....	1495	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2850	130	
*Avery.....	1495	Buda MU	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2850	130	
*Bell M.....	1525	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2900	113	
*Belmont B.....	1525	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2800	124	
*Bessemer G.....	1195	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2800	125	
*Bethlehem KN.....	1195	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3150	140	
*Birtch I.....	1285	Buda MU	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3100	130	
*Casco Model A.....	1785	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2840	125	
*Chevrolet T.....	1095	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3100	138	
*Clydesdale 10A.....	1585	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3210	140	
*Collins 18.....	1480	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3300	128	
*Corbett E-22.....	1600	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3300	128	
*Day-Elder AS.....	1600	Buda MU	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2700	132	
*Dearborn E (Speed).....	1525	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2840	135	
*Defiance G.....	1485	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	2840	135	
*Denby 31.....	1485	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3400	148	
*Deit A1.....	1695	H-Sp 7000	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3400	148	
*D-Oit A1.....	1695	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3400	148	
*Dorris K-2.....	1795	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3500	135	
*Eugol.....	1795	Buda MU	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3500	135	
*Federal SD.....	1890	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3600	132	
*Ford T.....	380	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3450	120	
*Forester A.....	1495	Cont N	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3500	132	
*Fullton 15.....	1590	Buda MU	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3500	132	
*Garford 15.....	1265	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3200	130	
*G. M. C. K-16.....	1265	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3200	130	
*Graham Brothers.....	1265	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3200	130	
*Graham-Pioneer 10 Speed T.....	1345	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3200	130	
*Higdon 15.....	1345	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3200	130	
*Higdon 15.....	1345	Ow	3 1/2 x 5	22.5 L	22.5 L	L	L	Lang	PT	F	Strm	V	.....	.....	.....	Rm	ABO	Ow	1 1/2 F	18.33	Jac	34x5	34x5	3200	130	

[illegible]

Trade Name and Model	Chassis Price	ENGINE DETAILS										GEARSET			REAR AXLE			TIRES, WHEELS, RIMS		Chassis Weight (Stripped)	Wheelbase																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
		Bore and Stroke	N. A. C. C.	Horsepower	Valve Arrangement	How Cooled	Radiator (Make)	Radiator (Type)	Lubrication	Carburetor	Fuel Feed	Governor (Make)	Clutch (Make)	Clutch (Type)	Ignition System	Engine Starter	Make	Location	Speeds			Universal (Make)	Springs (Make)	Final Drive	Make	Type	Total Gear Ratio in High	Total Gear Ratio in Low	Steering Gear (Make)	Front		Rear		Wheels (Make)	Rim Equipment																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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*Dearborn F.	2180	3 1/2 x 5 1/2	22.5	15	L	W	Chic	Fin	FS	Strm	V	...	Full	DD	ABO	AL	W	1 1/2 FI	8.5	25.5	Dit	34x4	34x5	Stm	Fr	3280	126</

1922	1921	1920	1919	1918	1917	1916	1915	1914	1913	1912	1911	1910	1909	1908	1907	1906	1905	1904	1903	1902	1901	1900	1899	1898	1897	1896	1895	1894	1893	1892	1891	1890	1889	1888	1887	1886	1885	1884	1883	1882	1881	1880	1879	1878	1877	1876	1875	1874	1873	1872	1871	1870	1869	1868	1867	1866	1865	1864	1863	1862	1861	1860	1859	1858	1857	1856	1855	1854	1853	1852	1851	1850	1849	1848	1847	1846	1845	1844	1843	1842	1841	1840	1839	1838	1837	1836	1835	1834	1833	1832	1831	1830	1829	1828	1827	1826	1825	1824	1823	1822	1821	1820	1819	1818	1817	1816	1815	1814	1813	1812	1811	1810	1809	1808	1807	1806	1805	1804	1803	1802	1801	1800	1799	1798	1797	1796	1795	1794	1793	1792	1791	1790	1789	1788	1787	1786	1785	1784	1783	1782	1781	1780	1779	1778	1777	1776	1775	1774	1773	1772	1771	1770	1769	1768	1767	1766	1765	1764	1763	1762	1761	1760	1759	1758	1757	1756	1755	1754	1753	1752	1751	1750	1749	1748	1747	1746	1745	1744	1743	1742	1741	1740	1739	1738	1737	1736	1735	1734	1733	1732	1731	1730	1729	1728	1727	1726	1725	1724	1723	1722	1721	1720	1719	1718	1717	1716	1715	1714	1713	1712	1711	1710	1709	1708	1707	1706	1705	1704	1703	1702	1701	1700	1699	1698	1697	1696	1695	1694	1693	1692	1691	1690	1689	1688	1687	1686	1685	1684	1683	1682	1681	1680	1679	1678	1677	1676	1675	1674	1673	1672	1671	1670	1669	1668	1667	1666	1665	1664	1663	1662	1661	1660	1659	1658	1657	1656	1655	1654	1653	1652	1651	1650	1649	1648	1647	1646	1645	1644	1643	1642	1641	1640	1639	1638	1637	1636	1635	1634	1633	1632	1631	1630	1629	1628	1627	1626	1625	1624	1623	1622	1621	1620	1619	1618	1617	1616	1615	1614	1613	1612	1611	1610	1609	1608	1607	1606	1605	1604	1603	1602	1601	1600	1599	1598	1597	1596	1595	1594	1593	1592	1591	1590	1589	1588	1587	1586	1585	1584	1583	1582	1581	1580	1579	1578	1577	1576	1575	1574	1573	1572	1571	1570	1569	1568	1567	1566	1565	1564	1563	1562	1561	1560	1559	1558	1557	1556	1555	1554	1553	1552	1551	1550	1549	1548	1547	1546	1545	1544	1543	1542	1541	1540	1539	1538	1537	1536	1535	1534	1533	1532	1531	1530	1529	1528	1527	1526	1525	1524	1523	1522	1521	1520	1519	1518	1517	1516	1515	1514	1513	1512	1511	1510	1509	1508	1507	1506	1505	1504	1503	1502	1501	1500	1499	1498	1497	1496	1495	1494	1493	1492	1491	1490	1489	1488	1487	1486	1485	1484	1483	1482	1481	1480	1479	1478	1477	1476	1475	1474	1473	1472	1471	1470	1469	1468	1467	1466	1465	1464	1463	1462	1461	1460	1459	1458	1457	1456	1455	1454	1453	1452	1451	1450	1449	1448	1447	1446	1445	1444	1443	1442	1441	1440	1439	1438	1437	1436	1435	1434	1433	1432	1431	1430	1429	1428	1427	1426	1425	1424	1423	1422	1421	1420	1419	1418	1417	1416	1415	1414	1413	1412	1411	1410	1409	1408	1407	1406	1405	1404	1403	1402	1401	1400	1399	1398	1397	1396	1395	1394	1393	1392	1391	1390	1389	1388	1387	1386	1385	1384	1383	1382	1381	1380	1379	1378	1377	1376	1375	1374	1373	1372	1371	1370	1369	1368	1367	1366	1365	1364	1363	1362	1361	1360	1359	1358	1357	1356	1355	1354	1353	1352	1351	1350	1349	1348	1347	1346	1345	1344	1343	1342	1341	1340	1339	1338	1337	1336	1335	1334	1333	1332	1331	1330	1329	1328	1327	1326	1325	1324	1323	1322	1321	1320	1319	1318	1317	1316	1315	1314	1313	1312	1311	1310	1309	1308	1307	1306	1305	1304	1303	1302	1301	1300	1299	1298	1297	1296	1295	1294	1293	1292	1291	1290	1289	1288	1287	1286	1285	1284	1283	1282	1281	1280	1279	1278	1277	1276	1275	1274	1273	1272	1271	1270	1269	1268	1267	1266	1265	1264	1263	1262	1261	1260	1259	1258	1257	1256	1255	1254	1253	1252	1251	1250	1249	1248	1247	1246	1245	1244	1243	1242	1241	1240	1239	1238	1237	1236	1235	1234	1233	1232	1231	1230	1229	1228	1227	1226	1225	1224	1223	1222	1221	1220	1219	1218	1217	1216	1215	1214	1213	1212	1211	1210	1209	1208	1207	1206	1205	1204	1203	1202	1201	1200	1199	1198	1197	1196	1195	1194	1193	1192	1191	1190	1189	1188	1187	1186	1185	1184	1183	1182	1181	1180	1179	1178	1177	1176	1175	1174	1173	1172	1171	1170	1169	1168	1167	1166	1165	1164	1163	1162	1161	1160	1159	1158	1157	1156	1155	1154	1153	1152	1151	1150	1149	1148	1147	1146	1145	1144	1143	1142	1141	1140	1139	1138	1137	1136	1135	1134	1133	1132	1131	1130	1129	1128	1127	1126	1125	1124	1123	1122	1121	1120	1119	1118	1117	1116	1115	1114	1113	1112	1111	1110	1109	1108	1107	1106	1105	1104	1103	1102	1101	1100	1099	1098	1097	1096	1095	1094	1093	1092	1091	1090	1089	1088	1087	1086	1085	1084	1083	1082	1081	1080	1079	1078	1077	1076	1075	1074	1073	1072	1071	1070	1069	1068	1067	1066	1065	1064	1063	1062	1061	1060	1059	1058	1057	1056	1055	1054	1053	1052	1051	1050	1049	1048	1047	1046	1045	1044	1043	1042	1041	1040	1039	1038	1037	1036	1035	1034	1033	1032	1031	1030	1029	1028	1027	1026	1025	1024	1023	1022	1021	1020	1019	1018	1017	1016	1015	1014	1013	1012	1011	1010	1009	1008	1007	1006	1005	1004	1003	1002	1001	1000	999	998	997	996	995	994	993	992	991	990	989	988	987	986	985	984	983	982	981	980	979	978	977	976	975	974	973	972	971	970	969	968	967	966	965	964	963	962	961	960	959	958	957	956	955	954	953	952	951	950	949	948	947	946	945	944	943	942	941	940	939	938	937	936	935	934	933	932	931	930	929	928	927	926	925	924	923	922	921	920	919	918	917	916	915	914	913	912	911	910	909	908	907	906	905	904	903	902	901	900	899	898	897	896	895	894	893	892	891	890	889	888	887	886	885	884	883	882	881	880	879	878	877	876	875	874	873	872	871	870	869	868	867	866	865	864	863	862	861	860	859	858	857	856	855	854	853	852	851	850	849	848	847	846	845	844	843	842	841	840	839	838	837	836	835	834	833	832	831	830	829	828	827	826	825	824	823	822	821	820	819	818	817	816	815	814	813	812	811	810	809	808	807	806	805	804	803	802	801	800	799	798	797	796	795	794	793	792	791	790	789	788	787	786	785	784	783	782	781	780	779	778	777	776	775	774	773	772	771	770	769	768	767	766	765	764	763	762	761	760	759	758	757	756	755	754	753	752	751	750	749	748	747	746	745	744	743	742	741	740	739	738	737	736	735	734	733	732	731	730	729	728	727	726	725	724	723	722	721	720	719	718	717	716	715	714	713	712	711	710	709	708	707	706	705	704	703	702	701	700	699	698	697	696	695	694	693	692	691	690	689	688	687	686	685	684	683	682	681	680	679	678	677	676	675	674	673	672	671	670	669	668	667	666	665	664	663	662	661	660	659	658	657	656	655	654	653	652	651	650	649	648	647	646	645	644	643	642	641	640	639	638	637	636	635	634	633	632	631	630	629	628	627	626	625	624	623	622	621	620	619	618	617	616	615	614	613	612	611	610	609	608	607	606	605	604	603	602	601	600	599	598	597	596	595	594	593	592	591	590	589	588	587	586	585	584	583	582	581	580	579	578	577	576	575	574	573	572	571	570	569	568	567	566	565	564	563	562	561	560	559	558	557	556	555	554	553	552	551	550	549	548	547	546	545	544	543	542	541	540	539	538	537	536	535	534	533	532	531	530	529	528	527	526	525	524	523	522	521	520	519	518	517	516	515	514	513	512	511	510	509	508
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Trade Name and Model	Chassis Price	ENGINE DETAILS										GEARSET			REAR AXLE			TIRES, WHEELS, RIMS			Chassis Weight (Stripped)	Wheelbase			
		Make and Model	Bore and Stroke	N.A.C.C.	Valve Arrangement	How Cooled	Radiator (Make)	Radiator (Type)	Lubrication	Carburetor	Fuel Feed	Governor (Make)	Clutch (Make)	Clutch (Type)	Ignition System	Engine Starter	Make	Type	Total Gear Ratio	Total Gear Ratio			Steering Gear (Make)	Front	Rear	Wheels (Make)	Rim Equipment
2 Ton—Cont'd																									
Schwartz K.	3000	Buda HTU	4 1/4 x 5 1/2	22.5 L	L	Fed	McC	Fin	Strm	Strm	G V	Mon	Full	DD	ABO	W	Shel	1 1/2 Fl	7.75	Ros	34 x 3 1/2	34 x 7	Sch	3090	146
Service 32	2900	Buda HTU	4 1/4 x 5 1/2	25.6 L	L	McC	Fin	Fin	Strm	Strm	V V	Pier	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Bim	4900	150
Southern 20.	3085	Buda HTU	4 1/4 x 5 1/2	25.6 L	L	McC	Fin	Fin	Strm	Strm	V V	Pier	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Bim	4900	150
Starling 2.	2400	Wau	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Pru	5725	142
Stoughton D.	2460	Her CU-3	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Gdy	4600	144
Superior E.	1505	Cont C-2	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Bim	3600	144
Titan 2.	1885	Cont N-4	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Opt	4400	156
Transport 35.	2860	Buda HTU	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Sch	4000	140
Triangle C.	2255	Wau HTU	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Sch	4000	147
Triumph 2.	2560	Buda HTU	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Sch	4000	144
Twin City.	3200	Buda HTU	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Sch	4000	144
Ultimate AJ.	3250	Buda HTU	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Sch	4000	144
Walker-Johnson A.	3500	Buda HTU	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Sch	4000	144
White N.	3250	Own FU	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Sch	4000	144
White 20	3250	Own FU	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Sch	4000	144
Wichita M.	2400	Wau BX	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Sch	4000	144
Wisconsin (Loganville)	1450	H-Sp 7000	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Sch	4000	144
Witt Will P.	2900	Cont C-4	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Sch	4000	144
Wolverine J2.	2245	Cont J-4	4 1/4 x 5 1/2	25.6 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	7.75	Ros	36 x 3 1/2	36 x 7	Sch	4000	148
2 1/2 Ton																									
Ace.	3350	Buda HTU	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
American 60.	3350	Cont K-4	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Apex E.	2850	Buda HTU	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Armstrong HWC	2850	Cont C-4	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Atco A.	3375	Buda HTU	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Atterbury 22C Std.	3475	Cont K-4	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Atterbury 22C LWB	3160	Her CU-3	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Available.	2550	Buda HTU	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Bell O.	2985	Cont C-2	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Besemer J2.	2985	Buda HTU	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Beta	2980	Cont K-4	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Brigadeport B.	2975	Cont K-4	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Brinton D.	3450	Cont K-4	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Brockway K5	3250	Cont K-4	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Chicago C.	3450	Cont K-4	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Clydesdale 65EX	3250	Cont K-4	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Clydesdale 65 X.	2770	Cont K-4	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Collier 22.	3000	Cont K-4	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Commerce 25B.	2750	Buda HTU	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Concord B.	3000	Cont K-4	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Corbett B-22.	2750	Buda HTU	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Dart Elder C.	2650	Buda HTU	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Dependable D.	3250	Cont K-4	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Diamond T-U.	2295	Buda HTU	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
D-Olt C.	2750	Buda HTU	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x 4	36 x 7	Day	5630	156
Erie A.	2750	Buda HTU	4 1/4 x 5 1/2	28.9 L	L	Idl	Own	Own	Strm	Strm	G V	Dup	Full	DD	Eis	W	Tim	1 1/2 Fl	8.50	Ros	36 x				

[illegible]

Chassis only.

Trade Name and Model	Chassis Price	ENGINE DETAILS										GEAR SET				REAR AXLE		TIRES, WHEELS, RIMS		Chassis Weight (Stripped)	Wheelbase				
		Bore and Stroke	N. A. C. C.	Valve Arrangement	How Cooled	Radiator (Make)	Radiator (Type)	Lubrication	Carburetor	Fuel Feed	Governor (Make)	Clutch (Make)	Clutch (Type)	Ignition System	Engine Starter	Make	Type	Total Gear Reduction in High	Total Gear Reduction in Low			Steering Gear	Rim Equipment		
																							Front	Rear	
5 Ton—Con'd																									
Cont B-2	5000	4 1/2 x 6	36.1	L	H	Chic	Fin	F	Strm	G	Con	B-Li	DD	Spl	W	Walk	10.33	10.75	Ros	Ros	36x6	40x12	Wal	22	8600 175
Win RAU	4725	4 1/2 x 6	33.5	L	H	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8400 180
Onida E.	4850	4 1/2 x 6	33.5	L	H	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8400 180
Parker M20.	4850	4 1/2 x 6	40	L	T	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9050 156
*Pierce Arrow R10.	4850	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9300 168
*Raimier B-17.	4850	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9300 168
*Rowe FW.	5100	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8000 170
*Schacht.	4400	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8700 174
Buda YTU	4900	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8200 168
Schwartz M.	4900	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8255 156
Schwartz ML.	4900	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8365 170
Selden Unit 90.	3900	4 1/2 x 6	36.1	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8460 186
Signal R.	4950	4 1/2 x 6	36.1	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9650 164
Standard K.	4950	4 1/2 x 6	36.1	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9510 180
*Sterling.	4950	4 1/2 x 6	36.1	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8700 164
*Sterling Chain.	5500	4 1/2 x 6	36.1	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9450 168
*Super Truck 100.	4300	4 1/2 x 6	36.1	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9950 174
*Titan 5.	5250	4 1/2 x 6	36.1	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8500 168
*Titan 6.	4700	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	7900 156
*Transport 7.	5500	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9100 166
*Taylor F.	4850	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	7600 170
Buda YTU	4900	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8000 172
Buda BTU	5000	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8200 168
Buda ATU	4850	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9300 164
Own DU	4500	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8100 174
Walter S. France A.	4500	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 162
*White 45.	4500	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	7500 160
*Wilcox F.	4500	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8500 162
*Wilson H.	3500	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	7000 148
Winther 109.	3500	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	7300 186
Wisconsin E.	3690	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	10200 162
Wisconsin L.	5200	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	8100 144
5 1/2, 6 and 7 Ton																									
Garford 150 A-7.	4850	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
Hall 7 Chain.	4850	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
Hurlbert E-E.	4850	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
*Kelly-Springfield K-60.	4850	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
*Kelly-Springfield K61.	4850	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
*MacDonald A.	5750	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
*Mack AC6 1/2.	6000	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
*Mack AC7 1/2.	6000	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
*Old Reliable L.	5050	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
*Schacht 7.	6000	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
*Service 102.	6000	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
*Sterling 7 1/2 Chain.	6000	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
*Tiffin 6 U-W.	4500	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
*Union J.W.	5800	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
*Walker R.	5350	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
*Wickens S.	5000	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm	G	Mon	Full	DD	W	W	Shel	10.25	10.66	Ros	Ros	36x6	40x12	Wal	22	9000 144
Winther 140.	4500	4 1/2 x 6	32.4	L	L	Chic	Fin	F	Strm																

ELECTRIC COMMERCIAL CARS

E. C. M.	Name and Model Number	Carrying Capacity	Chassis Weight	Chassis Price	Maximum Speed	Battery	Mileage Per Charge	Motor	Controller	Speeds Forward	Drive	Rear Axle	Springs	Front Tires	Rear Tires	Steering Gear	Wheelbase	Per Cent of Weight on Rear Wheels
	Atlantic 1C.....	2000	2770	.....	12	Opt	.....	G-E	G-E	4	C	Timk	2-El	34x4	36x4	Ross	193	65
	Atlantic 2C.....	4000	3590	.....	11	Opt	.....	G-E	G-E	4	C	Timk	2-El	34x4	36x3	Ross	115	65
	Atlantic 3C.....	7000	5220	.....	10	Opt	.....	G-E	G-E	5	C	Timk	2-El	36x5	40x5	Ross	135	65
	Atlantic 5C.....	10000	6230	.....	9	Opt	.....	G-E	G-E	5	C	Timk	2-El	36x6	40x5	Ross	144	65
	Atlantic 6C.....	13000	6940	.....	8	Opt	.....	G-E	G-E	5	C	Timk	2-El	36x6	40x6	Ross	156	65
	C-T D-1.....	1000	2200	1585	14	Opt	55	G-E	G-E	4	C-T	Flot	Shel	36x3	36x3 1/2	W	100	69
	C-T B-1.5.....	1500	2300	1985	14	Opt	60	G-E	G-E	4	C-T	Flot	Shel	36x3	36x4	W	91 1/2	65
	C-T D-1.5.....	1500	2300	1985	14	Opt	60	G-E	G-E	4	C-T	Flot	Shel	36x3	36x4	W	116	71
	C-T B-2.....	2000	2400	2150	14	Opt	50	G-E	G-E	4	C-T	Flot	Shel	36x3 1/2	36x5	W	101	66
	C-T D-2.....	2000	2400	2150	14	Opt	50	G-E	G-E	4	C-T	Flot	Shel	36x3 1/2	36x5	W	124	70
	C-T B-4.....	4000	4000	2575	12	Opt	50	G-E	G-E	4	C-T	Flot	Shel	36x4	36x4 1/2	W	116	68
	C-T C-6.....	6000	4200	2575	8	Opt	35	G-E	G-E	4	I	Dead	Shel	36x4	36x4 1/2	W	116	70
	C-T C-7.....	7000	5000	3550	10	Opt	45	G-E	G-E	4	I	Dead	Shel	36x5	36x5 1/2	W	126	65
	C-T A-7.....	7000	5800	3850	11	Opt	45	G-E	G-E	4	I	Dead	Shel	36x6	36x4 1/2	W	122	60
	C-T A-10.....	10000	6500	3960	10	Opt	45	G-E	G-E	4	I	Dead	Shel	36x7	36x5 1/2	W	132	59
	Kelland A.....	1000	1850	.....	15	Opt	50	G-E	G-E	4	R	Flot	Mer	34x3	34x3	Ross	102	60
	Kelland B.....	1500	1950	.....	15	Opt	50	G-E	G-E	4	R	Flot	Mer	34x3 1/2	34x3 1/2	Ross	102	60
	Kelland C.....	2000	2150	.....	15	Opt	50	G-E	G-E	4	R	Flot	Mer	34x3 1/2	34x4	Ross	102	60
	Lansden BG 1/4.....	1400	1600	1500	15	Opt	50	G-E	G-E	4	R	Flot	SP	32x4 1/2	32x4 1/2	Lav	108	50
	Lansden MC 1.....	2900	1850	1200	12	Opt	50	G-E	G-E	4	C	D	SP	36x3	36x3 1/2	KH	108	60
	Lansden MD 2.....	4400	2250	1100	11	Opt	50	G-E	G-E	4	C	D	SP	36x4	36x3 1/2	KH	120	60
	Lansden ME 3 1/4.....	5700	2950	1000	10	Opt	45	G-E	G-E	4	C	D	SP	36x5	36x4 1/2	KH	133	60
	Lansden MF 5.....	7500	3350	900	9	Opt	40	G-E	G-E	4	C	D	SP	36x6	36x5 1/2	KH	146	60
	Lansden MG 6.....	8900	.....	700	7	Opt	35	G-E	G-E	4	C	D	SP	36x7	36x6 1/2	KH	156	60
	Milburn Model 40.....	2000	1990	1985	15	Opt	40	G-E	G-E	4	W	Math	32x4 1/2	33x5	Gem	128	62	
	Milburn Model 43.....	1000	1690	1585	18	Opt	50	G-E	G-E	4	W	Math	32x4 1/2	32x4 1/2	Gem	115	56	
	*Walker 22.....	2000	2500	.....	14	Opt	60	West	West	5	O	Own	Math	34x3 1/2	36x4	Ross	101	66
	*Walker 42.....	4000	3700	.....	13	Opt	60	West	West	5	O	Own	Math	36x4	36x6	Ross	114	66
	Walker M 2.....	1250	2300	.....	15	Opt	60	West	West	5	O	Own	Math	34x3	36x3 1/2	Ross	94	66
	Walker N.....	10000	6300	.....	10	Opt	50	West	West	5	O	Own	Math	36x6	36x8 1/2	Ross	141	66
	Walker P.....	7000	5300	.....	11	Opt	50	West	West	5	O	Own	Math	36x5	36x5 1/2	Ross	131	66
	Walter EN.....	4000	4400	2575	15	Opt	50	G-E	G-E	5	O	Dead	.....	36x4	36x7	Gem	114	60
	Walter EL.....	7000	4550	3475	13 1/2	Opt	50	G-E	G-E	5	O	Dead	.....	36x5	36x4	Gem	130	60
	Walter ES.....	10000	7200	3975	12	Opt	50	G-E	G-E	5	O	Dead	.....	36x6	40x6	Ros	150	60
	Ward WS 2.....	1650	.....	13	Opt	75	G-E	G-E	4	W	Shel	Shel	32x3	32x3 1/2	Own	88	56	
	Ward WA.....	2860	.....	12	Opt	52 1/2	G-E	G-E	4	W	Shel	Shel	32x3 1/2	34x4	Own	90	61	
	Ward WA 2.....	2470	.....	12	Opt	72 1/2	G-E	G-E	4	W	Shel	Shel	32x3 1/2	34x4	Own	90	61	
	Ward WB.....	3850	.....	10.5	Opt	45	G-E	G-E	4	W	Shel	Shel	34x4	36x5	Own	102	64	
	Ward WB 2.....	3350	.....	10.5	Opt	70	G-E	G-E	4	W	Shel	Shel	34x4	36x5	Own	102	64	
	Ward WD.....	4875	.....	9	Opt	50	G-E	G-E	4	W	Shel	Shel	36x5	36x7	Own	114	68	
	Ward WD 2.....	4350	.....	9	Opt	60	G-E	G-E	4	W	Shel	Shel	36x5	36x7	Own	114	68	
	Ward WF.....	7200	.....	8	Opt	40	G-E	G-E	5	W	Shel	Shel	36x6	36x10	Own	132	70	
	Ward WF 2.....	6450	.....	8	Opt	40	G-E	G-E	5	W	Shel	Shel	36x6	36x10	Own	132	70	
	Ward WH.....	9400	.....	7	Opt	38	G-E	G-E	5	W	Shel	Shel	36x7	40x12	Own	144	71	
	Ward WH 2.....	8200	.....	7	Opt	38	G-E	G-E	5	W	Shel	Shel	36x7	40x12	Own	144	71	

Manufacturers and Models Included in Specifications on Preceding Pages

Ace-1 1/2, 2 1/2—American Motor Truck Co., Newark, Ohio.
 Acme-1, 1 1/2, 2, 3, 4 1/2, 6 1/2—Acme Motor Truck Co., Cadillac, Mich.
 American-2 1/2, 4, 5—American Motor Truck & Tractor Co., Portland, Conn.
 Apex-1, 1 1/2, 2 1/2, 3 1/2—Hamilton Motor Co., Grand Haven, Mich.
 Armleder-1, 1 1/2, 2 1/2, 3 1/2—O. Armleder Co., Cincinnati, Ohio.
 Atco-1 1/2, 2 1/2—American Truck & Trailer Corp., Kankakee, Ill.
 Atlantic-1, 2, 3, 5, 6—Atlantic Electric Vehicle Co., Newark, N. J.
 Atlas-1, 1 1/2—Industrial Motor Corp., Rochester, N. Y.
 Atterbury-1 1/2, 2 1/2, 3 1/2, 5—Atterbury Motor Car Co., Buffalo, N. Y.
 Autocar-1 1/2, 2, 3 1/2, 5—Autocar Co., Ardmore, Pa.
 Available-1 1/2, 2, 2 1/2, 3 1/2, 5—Available Truck Co., Chicago, Ill.
 Avery-1—Avery Company, Peoria, Ill.
 Bell-1, 1 1/2, 2 1/2—Iowa Motor Truck Co., Ottumwa, Ia.
 Belmont-1, 1 1/2, 2, 3—Belmont Motors Corp., Harrisburg, Pa.
 Bessemer-1, 1 1/2, 2 1/2, 4—Bessemer Motor Truck Co., Grove City, Pa.
 Bethlehem-1, 2, 3—Bethlehem Motors Corp., Allentown, Pa.
 Betz-1, 2 1/2—Betz Motor Truck Co., Hammond, Ind.
 Birch-1—Birch Motor Cars, Chicago, Ill.
 Bridgeport-1 1/2, 2 1/2, 3 1/2—Bridgeport Motor Truck Co., Bridgeport, Conn.
 Brinton-1 1/2, 2 1/2—Brinton Motor Truck Co., Philadelphia, Pa.
 Brockway-1 1/2, 2 1/2, 3 1/2, 5—Brockway Motor Truck Co., Cortland, N. Y.
 Buffalo-1 1/2, 2 1/2 T—Buffalo Truck & Tractor Corp., Clarence, N. Y.
 C. T.-1, 1 1/2, 2, 3 1/2, 5—Commercial Truck Co., Philadelphia, Pa.
 Capitol-1 1/2, 2 1/2, 3 1/2—Capitol Motors Corp., Fall River, Mass.
 Casco-1—Casco Motors, Inc., Portland, Maine.
 Case-2—J. I. Case Plow Works Co., Racine, Wis.
 Chevrolet-1 1/2—Chevrolet Motor Co. of Mich., Flint, Mich.
 Chicago-1 1/2, 2 1/2, 3 1/2, 5—Chicago Motor Truck, Inc., Chicago, Ill.
 Climber-1 1/2—Climber Motor Corp., Little Rock, Ark.
 Clydesdale-1 1/2, 1 1/2, 2 1/2, 3 1/2, 5—Clydesdale Motor Truck Co., Clyde, Ohio.
 Collier-1, 1 1/2, 2, 2 1/2—Collier Motor Truck Co., Bellevue, Ohio.
 Commerce-1 1/2, 1 1/2, 2, 2 1/2—Commerce Motor Truck Co., Detroit, Mich.
 Concord-1 1/2, 2, 2 1/2, 3—Abbott-Downing Truck & Body Co., Concord, N. H.
 Corbitt-1 1/2, 1 1/2, 2, 2 1/2, 3, 4, 5—Corbitt Motor Truck Co., Henderson, N. C.
 Cyclone-1 1/2—The Cyclone Motor Corp., Greenville, S. C.
 Dart-1 1/2, 2 1/2, 3 1/2—Dart Truck & Tractor Corp., Waterloo, Ia.
 Day-Elder-1, 1 1/2, 2, 2 1/2, 3 1/2, 5—Day-Elder Motors Corp., Newark, N. J.
 Dearborn-1, 1 1/2, 2—Dearborn Truck Co., Chicago, Ill.
 Defiance-1, 1 1/2, 2—Defiance Motor Truck Co., Defiance, Ohio.
 Denby-1, 1 1/2, 2, 3, 4, 5—Denby Motor Truck Co., Detroit, Mich.
 Dependable-1, 1 1/2, 2, 2 1/2, 3 1/2—Dependable Truck & Tractor Co., East St. Louis, Ill.
 Diamond T-1 1/2, 1 1/2, 2, 3 1/2, 5—Diamond T Motor Car Co., Chicago, Ill.

Diehl-1, 1 1/2—Diehl Motor Truck Works, Philadelphia, Pa.
 Dixon-Dixon Motor Truck Co., Altoona, Pa.
 Dodge-1 1/2—Dodge Bros., Detroit, Mich.
 D-Olt-1, 1 1/2, 2 1/2, 5—D-Olt Motor Truck Co., Inc., Long Island City, N. Y.
 Dorris-1, 2, 3 1/2—Dorris Motor Car Co., St. Louis, Mo.
 Dort-1 1/2—Dort Motor Car Co., Flint, Mich.
 Double Drive-4—Double Drive Truck Co., Chicago, Ill.
 Douglas-1 1/2, 2, 3—Douglas Motors Corp., Omaha, Neb.
 Drake-2—Drake Motor & Tire Mfg. Corp., Knoxville, Tenn.
 Duplex-2, 3 1/2—Duplex Truck Co., Lansing, Mich.
 Eagle-2—Eagle Motor Truck Corp., St. Louis, Mo.
 Erie-1 1/2, 2 1/2—Erie Motor Truck Mfg. Co., Erie, Pa.
 Eugol-1—Eugol Motor Truck Co., Kenosha, Wis.
 F. W. D.-3—Four-Wheel Drive Auto Co., Clintonville, Wis.
 Facto-2 1/2—Facto Motor Trucks, Springfield, Mass.
 Fageol-2, 3, 4, 5—Fageol Motors Co., Oakland, Cal.
 Fargo-2—Fargo Motor Truck Co., Chicago, Ill.
 Federal-1 1/2, 1 1/2, 2, 3 1/2, 5, T.T.—Federal Motor Truck Co., Detroit, Mich.
 Ford-1—Ford Motor Co., Highland Park, Mich.
 Forscher-1, 1 1/2, 2, 3—Forschler Motor Truck Mfg. Co., New Orleans, La.
 Front Drive-1 1/2—Double Drive Truck Co., Chicago, Ill.
 Fulton-1, 2, T.T.—Fulton Motors Corp., Farmingdale, N. Y.
 G. M. C.-1, 2, 3 1/2, 5—General Motors Truck Co., Pontiac, Mich.
 G. W. W.-1 1/2—Wilson Truck Mfg. Co., Henderson, Ia.
 Garford-1 1/2, 1 1/2, 2, 3 1/2, 5, 7 1/2—Garford Motor Truck Co., Lima, O.
 Gary-1, 2, 2 1/2, 3 1/2, 5—Gary Motor Corp., Gary, Ind.
 Gersix-1 1/2, 2 1/2, 3—Gersix Mfg. Co., Seattle, Wash.
 Giant-2 1/2, 3 1/2—Giant Truck Corp., Chicago Heights, Ill.
 Graham-1, 1 1/2—Graham Brothers, Evansville, Ind.
 Gramm-Bernstein-1, 1 1/2, 2, 3, 3 1/2, 4, 5—Gramm-Bernstein Motor Truck Co., Lima, Ohio.
 Hal-Fur-2, 3 1/2—Hal-Fur Motor Truck Co., Cleveland, Ohio.
 Hall-2 1/2, 3 1/2, 5, 7—Lewis-Hall Motors Corp., Detroit, Mich.
 Harvey-2, 2 1/2, 3 1/2—Harvey Motor Truck Co., Harvey, Ill.
 Hawkeye-1—Hawkeye Truck Co., Sioux City, Iowa.
 Hendrickson-2 1/2, 3 1/2, 5—Hendrickson Motor Truck Co., Chicago, Ill.
 Higrade-1, 1 1/2—Higrade Motors Co., Harbor Springs, Mich.
 H. R. L.-1 1/2, 2 1/2—H. R. L. Motor Co., Seattle, Wash.
 Hug-1 1/2—The Hug Co., Highland, Ill.
 Hurlburt-1 1/2, 2 1/2, 3 1/2, 5, 7—Harrisburg Mfg. & Boiler Co., Harrisburg, Pa.
 Huron-1 1/2, 2 1/2—Huron Truck Co., Bad Axe, Mich.
 Independent-1, 1 1/2, 2 1/2—Independent Motor Truck Co., Inc., Davonport, Ia.
 Indiana-1, 1 1/2, 2, 2 1/2, 3 1/2, 5—Indiana Truck Corp., Marion, Ind.
 International-1, 1 1/2, 2, 3, 5—International Harvester Co., Chicago, Ill.
 Jackson-3 1/2—Jackson Motors Corp., Jackson, Mich.
 Kalamazoo-1 1/2, 2 1/2, 3 1/2—Kalamazoo Motor Corp., Kalamazoo, Mich.

Kearns— $\frac{1}{2}$, 1 $\frac{1}{2}$ —Kearns-Dughie Motors Co., Danville, Pa.
 Kelland—Kelland Motor Car Co., Newark, N. J.
 Kelly-Springfield—1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5, 6—Kelly-Springfield Motor Truck Co., Springfield, O.
 Keystone—2—Keystone Motor Truck Corp., Philadelphia, Pa.
 Kimball—2, 2 $\frac{1}{2}$, 3, 4, 5—Kimball Motor Truck Co., Los Angeles, Cal.
 Kissel—1, 1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 4, 5—Kissel Motor Car Co., Hartford, Wis.
 Kleiber—1, 1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—Kleiber & Co., Inc., San Francisco, Cal.
 Koehler—1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, T.T.—H. J. Koehler Motors Corp., Bloomfield, N. J.
 Lange—2, 2 $\frac{1}{2}$ —Lange Motor Truck Co., Pittsburgh, Pa.
 Lansden— $\frac{1}{2}$, 1, 2, 3 $\frac{1}{2}$, 5, 6—Lansden Company, Danbury, Conn.
 Larrabee-Deyo—1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—Larrabee-Deyo Motor Truck Co., Inc., Binghamton, N. Y.
 Lombard—T.T.—Lombard Auto Tractor Truck Corp., New York, N. Y.
 Luedinghaus—1, 1 $\frac{1}{2}$, 2—Luedinghaus-Espenschied Wagon Co., St. Louis, Mo.
 Maccar—1 $\frac{1}{2}$, 2, 3, 4, 5—Maccar Truck Co., Scranton, Pa.
 MacDonald—7—MacDonald Truck & Tractor Co., San Francisco, Cal.
 Mack—1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5, 6 $\frac{1}{2}$, 7 $\frac{1}{2}$, T.T.—International Motor Co., New York, N. Y.
 Master—1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5, T.T.—Master Trucks, Inc., Chicago, Ill.
 Maxwell—1 $\frac{1}{2}$ —Maxwell Motor Co., Inc., Detroit, Mich.
 Menominee—1, 1 $\frac{1}{2}$, 2, 3 $\frac{1}{2}$, 5—Menominee Motor Truck Co., Clintonville, Wis.
 Milburn—Milburn Wagon Co., Toledo, O.
 Moline—1 $\frac{1}{2}$ —Moline Plow Co., Moline, Ill.
 Moreland—1, 1 $\frac{1}{2}$, 2, 3, 5—Moreland Motor Truck Co., Los Angeles, Cal.
 Napoleon—1, 1 $\frac{1}{2}$ —Napoleon Motors Co., Traverse City, Mich.
 Nash—1, 2—Nash Motors Co., Kenosha, Wis.
 Nelson-LeMoon—1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—Nelson & LeMoon, Chicago, Ill.
 Netco—2, 2 $\frac{1}{2}$ —New England Truck Co., Fitchburg, Mass.
 Niles—2—South Main Motor Co., Pittsburgh, Pa.
 Noble—1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$ —Noble Motor Truck Co., Kendallville, Ind.
 Northway—2, 3 $\frac{1}{2}$ —Northway Motors Co., Natick, Mass.
 Norwalk—1, 1 $\frac{1}{2}$ —Norwalk Motor Car Co., Martinburg, W. Va.
 O. K.—1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$ —Oklahoma Auto Mfg. Co., North Muskogee, Okla.
 Ogden— $\frac{1}{2}$, 1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—Ogden Motor Truck Co., Chicago, Ill.
 Old Reliable—1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5, 6—Old Reliable Motor Truck Co., Chicago, Ill.
 Oldsmobile—1—Olds Motor Works, Lansing, Mich.
 Olympic—2 $\frac{1}{2}$ —Olympic Motor Truck Co., Tacoma, Wash.
 Oneida—2, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—Oneida Motor Truck Co., Green Bay, Wis.
 Oshkosh—2, 2 $\frac{1}{2}$ —Oshkosh Motor Truck Mfg. Co., Oshkosh, Wis.
 Overland— $\frac{1}{2}$ —Willis-Overland Co., Toledo, O.
 Packard—2, 3 $\frac{1}{2}$, 5—Packard Motor Car Co., Detroit, Mich.
 Paige—1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$ —Paige-Detroit Motor Car Co., Detroit, Mich.
 Parker—1, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—Parker Motor Truck Co., Milwaukee, Wis.
 Patriot—1, 2, 3—Patriot Mfg. Co., Lincoln, Neb.
 Penn—1, 2—Penn Motors Corp., 1714 N. Broad St., Philadelphia, Pa.
 Pierce-Arrow—2, 3 $\frac{1}{2}$, 5—Pierce-Arrow Motor Car Co., Buffalo, N. Y.
 Pioneer—1—Pioneer Truck Co., Chicago, Ill.
 Pittsburgher—2 $\frac{1}{2}$, 3 $\frac{1}{2}$ —Pittsburgh Truck Mfg. Co., Pittsburgh, Pa.
 Power—1 $\frac{1}{2}$, 3 $\frac{1}{2}$ —Power Truck & Tractor Co., St. Louis, Mo.
 Premocar—1 $\frac{1}{2}$ —Preston Motors Corp., Birmingham, Ala.
 Rainier— $\frac{1}{2}$, 1, 1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—Rainier Motor Corp., New York, N. Y.
 Ranger—2—Southern Motor Mfg. Ass'n, Ltd., Houston, Tex.
 Reliance—1 $\frac{1}{2}$, 2 $\frac{1}{2}$ —Reliance Motor Truck Co., Appleton, Wis.
 Reo—1 $\frac{1}{2}$ —Reo Motor Car Co., Lansing, Mich.

Republic— $\frac{1}{2}$, 1, 1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$ —Republic Motor Truck Co., Inc., Alma, Mich.
 Rowe—1 $\frac{1}{2}$, 2, 3, 4, 5—Rowe Motor Mfg. Co., Lancaster, Pa.
 Ruggles—1, 2—Ruggles Motor Truck Co., Saginaw, Mich.
 Rumely—1 $\frac{1}{2}$ —Advance-Rumely Thresher Co., Inc., La Porte, Ind.
 Samson— $\frac{1}{2}$, 1 $\frac{1}{2}$ —Samson Tractor Co., Janesville, Wis.
 Sanford—2, 3 $\frac{1}{2}$, 5—Sanford Motor Truck Co., Syracuse, N. Y.
 Schacht—2, 3, 4, 5, 7—G. A. Schacht Motor Truck Co., Cincinnati, O.
 Schwartz—1, 2, 3, 5—Schwartz Motor Truck Co., Reading, Pa.
 Seiden—1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—Industrial Motor Corp., Rochester, N. Y.
 Service— $\frac{1}{2}$, 1 $\frac{1}{2}$, 1 $\frac{1}{2}$, 2, 3, 3 $\frac{1}{2}$, 4—Service Motor Truck Co., Wabash, Ind.
 Signal—1, 1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—Signal Truck Corp., Detroit, Mich.
 Southern—1, 1 $\frac{1}{2}$, 2—Southern Truck & Car Corp., Greenboro, N. C.
 Standard— $\frac{1}{2}$, 1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—Standard Motor Truck Co., Detroit, Mich.
 Sterling—1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5, 7 $\frac{1}{2}$ —Sterling Motor Truck Co., Milwaukee, Wis.
 Stewart—1, 1 $\frac{1}{2}$, 1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$ —Stewart Motor Corp., Buffalo, N. Y.
 Stoughton— $\frac{1}{2}$, 1, 1 $\frac{1}{2}$, 2, 3—Stoughton Wagon Co., Stoughton, Wis.
 Super Truck—2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—O'Connell Motor Truck Co., Waukegan, Ill.
 Superior—1, 2, 4—Superior Motor Truck Co., Atlanta, Ga.
 Tiffin—1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5, 6—Tiffin Wagon Co., Tiffin, Ohio.
 Titan—2, 3 $\frac{1}{2}$, 5, 6—Titan Truck Co., Milwaukee, Wis.
 Thomart Speed—1 $\frac{1}{2}$ —Thomart Motor Co., Kent, Ohio.
 Tower—1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$ —Tower Motor Truck Co., Greenville, Mich.
 Traffic—1 $\frac{1}{2}$, 2, 3—Traffic Motor Truck Corp., St. Louis, Mo.
 Transport—1, 1 $\frac{1}{2}$, 2, 3, 3 $\frac{1}{2}$, 5—Transport Truck Co., Mt. Pleasant, Mich.
 Traylor—1 $\frac{1}{2}$, 2, 3, 5—Traylor Eng. & Mfg. Co., Cornwells, Pa.
 Triangle— $\frac{1}{2}$, 1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$ —Triangle Motor Truck Co., St. Johns, Mich.
 Triumph—1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$ —Triumph Truck & Tractor Co., Kansas City, Mo.
 Twin City—2, 3 $\frac{1}{2}$ —Twin City Company, Minneapolis, Minn.
 Ultimate—1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$, 3, 5—Vreeland Motor Co., Inc., Newark, N. J.
 Union—2 $\frac{1}{2}$, 4, 6—Union Motor Truck Co., Bay City, Mich.
 United—1, 1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—United Motor Products Co., Grand Rapids, Mich.
 Ursus—1, 1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$ —Ursus Motor Co., Inc., Chicago, Ill.
 U. S.—1 $\frac{1}{2}$, 1 $\frac{1}{2}$, 2, 3, 4, 5—United States Motor Truck Co., Cincinnati, Ohio.
 Velle—1 $\frac{1}{2}$ —Velle Motors Corp., Moline, Ill.
 Vim— $\frac{1}{2}$, 1, 2, 3—Vim Motor Truck Co., Philadelphia, Pa.
 Vulcan—2 $\frac{1}{2}$ —Vulcan Mfg. Co., Seattle, Wash.
 Walker— $\frac{1}{2}$, 1, 2, 3 $\frac{1}{2}$, 5—Walker Vehicle Co., Chicago, Ill.
 Walker-Johnson—2, 2 $\frac{1}{2}$ —Walker-Johnson Truck Co., Woburn, Mass.
 Walter—2, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5, 7—T. T. Walter Truck Co., New York, N. Y.
 Walter-Fink Dumont White, Inc., New York, N. Y.
 Ward— $\frac{1}{2}$, 1, 2, 3 $\frac{1}{2}$, 5—Ward Motor Vehicle Co., Mt. Vernon, N. Y.
 Ward La France—2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—Walker Motors Inc., New York, N. Y.
 Watson— $\frac{1}{2}$, 3 $\frac{1}{2}$, T.T.—Watson Wagon Co., Canastota, N. Y.
 White— $\frac{1}{2}$, 2, 3 $\frac{1}{2}$, 5—White Co., Cleveland, Ohio.
 Wichita—1, 2, 3, 3 $\frac{1}{2}$, 5 $\frac{1}{2}$ —Wichita Falls Motors Co., Wichita Falls, Tex.
 Wilcox—1, 1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—Wilcox Trux, Inc., Minneapolis, Minn.
 Wilson—1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5—J. C. Wilson Co., Detroit, Mich.
 Winther—1, 1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5, 7—Winther Motor Truck Co., Kenosha, Wis.
 Wisconsin (Loganville)—2, 2 $\frac{1}{2}$ —Wisconsin Truck Co., Loganville, Wis.
 Wisconsin (Sauk City)—1, 1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$ —Wisconsin Farm Tractor Co., Sauk City, Wis.
 Witt-Will—1 $\frac{1}{2}$, 2—Witt-Will Co., Inc., Washington, D. C.
 Wolverine—1, 1 $\frac{1}{2}$, 2, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$ —American Commercial Car Co., Detroit, Mich.
 Yellow Cab— $\frac{1}{2}$, 1 $\frac{1}{2}$ —Yellow Cab Mfg. Co., Chicago, Ill.

Steel and Rubber Markets

Steel Products Prices

Per ton—Pittsburgh—	
Billets—Bessemer	\$40 00 a
Open hearth	40 00 a
Forging	43 00 a 47 00
Sheet bars	40 00 a
Slabs	40 00 a

Sheets

The following prices are for 100-bundle lots and over f.o.b. mill:		
Blue Annealed Sheets—		
Pittsburgh	\$2 50 a	2 75
Philadelphia	2 82 $\frac{1}{2}$ a	3 07 $\frac{1}{2}$
New York	2 84 a	3 00
Galvanized Sheets—		
Pittsburgh	4 50 a	4 75
New York	4 84 a	5 00
Tin Mill Black Plate—		
Pittsburgh	3 50 a	3 75

Rubber Very Quiet

Plantations—		
1st latex, cr., spot	22 $\frac{1}{2}$ a	..
Nov.	22 $\frac{1}{2}$ a	..
Dec.	.. a	22 $\frac{1}{2}$
Jan.-Mar.	.. a	23 $\frac{1}{2}$
Ribbed, smk., sh., spot	22 $\frac{1}{2}$ a	..
Nov.	22 $\frac{1}{2}$ a	..
Dec.	.. a	22 $\frac{1}{2}$
Jan.-Mar.	.. a	23 $\frac{1}{2}$
April-June	.. a	23 $\frac{1}{2}$
*Brown crepe, thin, clean	.. a	22
Specky	.. a	21 $\frac{1}{2}$
Rolled	.. a	20 $\frac{1}{2}$
Amber—		
*No. 1	.. a	22 $\frac{1}{2}$
No. 2	.. a	22
No. 3	.. a	21 $\frac{1}{2}$
Para—		
Up-river, fine	.. a	24
do coarse	.. a	17 $\frac{1}{2}$
*Island, fine	22 $\frac{1}{2}$ a	..
do coarse	16 a	..

Cauchio Ball—

Upper	18 a	..
Lower	16 a	..
Cameta	14 $\frac{1}{2}$ a	..
*Centrals—		
Corinto	.. a	11
*Esmeralda	.. a	11
*Mex scrap	.. a	9 $\frac{1}{2}$
*Guayule—		
Wet	.. a	..
Dry	.. a	27
*Balata—		
Block, Ciudad	.. a	56
Block, Colombian	.. a	42
Panama	.. a	40
Sheet	68 a	70
*Benuela, No. 2	7 a	9
*Kassal—		
Pr. black	14 a	..
Pr. red	10 a	12
*Nominal.		

Harry Mason Elected Head of California Trade Association

One of the best meetings ever held in the history of the organization, was staged by the California Automobile Trade Association, at Santa Barbara, Cal., October 16 and 17. The event was the general convention of the association, attended by several hundred delegates from all parts of California.

The first day was given over to craft meetings, with a banquet topping off the day with speeches by experts, including Captain H. A. Phillips, of a Santa Barbara newspaper. The general meeting was

held the second day with other speakers officiating, and reports from the crafts.

Harry E. Mason, of Los Angeles, was elected president to succeed George Habermfelder, who has held the office for several years. U. S. Grant, of San Diego and Charles Dunton, of Riverside, were elected vice presidents of the southern division of the association. George R. Murphy and Walter B. Fawcett, vice-presidents of the northern division. Robert W. Martland, was re-elected secretary-manager-treasurer, unanimously. He has held that position since the inception of the state organization several years ago.

The garage and repair craft, recommended a series of educational studies for mechanics in an effort to improve the quality and skill of the men who repair motor cars. They did not adopt the resolution to license mechanics. One of the things of great importance to the association was adoption of by-laws, which were passed after much discussion by all the delegates.

The matter of legislation, which will come before the governing bodies at Sacramento next January were discussed. It was pointed out that much adverse legislation, aimed at the automobile industry, would be introduced, just as was done in 1921, and the automobile men determined to use their efforts to fight bad legislation and advocate good laws.

The Huckster as a Motor Truck Prospect

(Continued from page 26)

truck and tires, so that depreciation is very low. The owner of the truck usually drives it himself, so that he favors it at all times. He oils it frequently, tightens, keeps air in the tires, and does all those little things that make for long life, and the result is that the truck should be good for ten years' work at the least estimate.

One of the peddler trucks in Columbus, the Reo owned by "Big Sam" Mangia, has seen seven years' service to date, and is good for many more years. Two other Mangia brothers also have fruit trucks of the same make, and they have been in use for a number of years too.

Most of these hucksters buy the striped chassis, and then have a body builder make them a body according to their own

ideas. While most of these bodies are similar in the main dimensions, each owner has a few little ideas of his own that he wants incorporated in the body made for him. Each has a rear entrance, with rear step, so that customers may enter if they wish and pick out the vegetables or fruit they wish to purchase.

The bodies used on the Columbus trucks cost approximately \$550 each.

There is a big field for truck dealers to sell light trucks to hucksters of this type, for every city in the country can support a large number of legitimate peddlers who cover regular routes.

If you are a truck dealer wondering where to look for prospects, take a slant over your local field and maybe you'll find several of the old horse drawn huckster wagons just about due for replacement with trucks.

GET THE BUSINESS!

To Rent Trailers for Industrial Usage

Renting trailers or selling trailers on a rental basis is a new plan adopted by the Martin Rocking Fifth Wheel Co., of Springfield, Mass. The scheme will help educate the public to the advantage of the trailer by means of practical demonstrations. In speaking of this new departure Mr. Martin says:

"We find that there are many merchants having much trucking to do, such as the lumber dealer, the contractor, the truckman, who realize in a general way that the trailer would materially reduce their hauling costs, yet for various reasons hesitate to adopt them. We decided by taking this step and assuming all risk ourselves that we could conclusively demonstrate that the trailer is a big money-saver, yet, by receiving rental, we would be paid for the demonstration. The very small charge that we make—\$1.00 per day per ton capacity—will pay us and also pay a handsome return to the renter. For instance, a trucking company running between Springfield and New York, getting a dollar a hundred and making two round trips a week, has an earning capacity with a 5-ton trailer (which he can easily pull

in addition to his regular load) of \$400 a week and our rental charge is only \$35.

"While the economies of the trailer system have been known for some years, general conditions have been such the past two years that very little new equipment of any kind has been sold but the indications are now that the trailer will come into its own. Every motor truck manufacturer is making and listing short wheelbase trucks to be used as tractors. The General Motors Truck Co. have just announced a line of tractors, from 5 to 15 tons capacity. The Pierce-Arrow Company make a specially geared truck for a tractor; in fact, every make of truck in the country is being used for hauling trailers.

"Great Britain is ahead of us in the use of the tractor-trailer principle. The officials there are advocating it as the most effective means of curbing the constant ruthless wear and tear of the highways. Just as large loads can be carried when the weight is distributed over a number of axles as when it is all put on one axle. The 'Commercial Motor,' one of England's leading motor magazines, is now devoting pages to pointing out the many advantages of the trailer system."

Statement of Ownership, Management, Circulation, Etc.

Required by Act of Congress of August 24, 1912
Of COMMERCIAL CAR JOURNAL,
published monthly at Phila., Pa.
for Oct. 1, 1922

State of Pennsylvania
County of Philadelphia, ss.:

Before me, a Notary Public in and for the state and county aforesaid, personally appeared James Artman, who, having been duly sworn according to law, deposes and says that he is the Editor of the COMMERCIAL CAR JOURNAL, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication, for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business manager are:
Publisher, CHILTON COMPANY, 49th and Market Sts., Philadelphia, Pa.
Editor, James Artman, 4538 Chestnut St., Philadelphia, Pa.
Managing Editor, Albert G. Metz, So. Ardmore, Pa.
Business Manager, C. A. Musselman, Merion, Pa.
2. That the owners are:
James Artman, 4538 Chestnut St., Philadelphia, Pa.
George H. Buzby, Wellington Apartments, 19th and Walnut Sts., Philadelphia, Pa.
C. A. Musselman, Merion, Pa.
A. H. Vaux, Penllyn, Pa.
3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.
4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholders or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders, who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and that this affiant has no reason to believe that any other person, association or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

JAMES ARTMAN, Editor.

Sworn and subscribed before me this 3rd day of October, 1922.

(Seal) HARRY SMITH.
(My commission expires March 7, 1925.)



Views of the Trail-Ford, the Super-Truck, Carrying a Load of Cattle and Operating a 5 Ton Load in Excavation Work. These Jobs Are Offered by the Automotive Utilities Corp., Detroit, Mich.

The tractor is equipped with special wheels, providing a 36-in. tread at the rear. A feature of the wheel is an 18-in. drum on the inside of it, which together with a cable permits a driver to readily snub his truck out of almost any condition, such as being mired in a hole, that would ordinarily require a towing vehicle. The complete tractor, stake body and special wheel equipment sells at \$2600 f. o. b. Detroit, and the complete 4-yd. Winsor gravity dump outfit lists at \$3925 f.o.b.

Price List of Truck Pneumatic Tire Casings, With Capacities and Inflation Pressures of Larger Sizes

	36 x 6					38 x 7					40 x 8					42 x 9					44 x 10				
	Price	Carrying Capacity	Inflation Pressure	Price	Carrying Capacity	Inflation Pressure	Price	Carrying Capacity	Inflation Pressure	Price	Carrying Capacity	Inflation Pressure	Price	Carrying Capacity	Inflation Pressure	Price	Carrying Capacity	Inflation Pressure	Price	Carrying Capacity	Inflation Pressure	Price	Carrying Capacity	Inflation Pressure	
Achilles Rubber & Tire Co., Binghamton, N. Y.	30 3 1/2	32 4	34 4	36 4 1/2	38 5	34 5	34 5	34 5	34 5	34 5	34 5	34 5	34 5	34 5	34 5	34 5	34 5	34 5	34 5	34 5	34 5	34 5	34 5	34 5	
Achilles Cord, non-skid	30.00	2200	90	33.00	2200	90	33.00	2200	90	33.00	2200	90	33.00	2200	90	33.00	2200	90	33.00	2200	90	33.00	2200	90	
Aeolus Rubber Mfg. Co., Trenton, N. J.	16.00	29.00	31.00	35.00	37.00	47.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	
Aeolus Cord, non-skid	16.00	29.00	31.00	35.00	37.00	47.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	49.00	
Ajax Rubber Co., Inc., New York, N. Y.	14.65	29.15	30.85	37.70	39.50	46.95	48.15	49.30	113.85	3000	100	146.65	4000	100	317.25	6000	130	317.25	6000	130	317.25	6000	130	317.25	6000
Ajax Improved Black Tread Cord, non-skid	14.65	29.15	30.85	37.70	39.50	46.95	48.15	49.30	113.85	3000	100	146.65	4000	100	317.25	6000	130	317.25	6000	130	317.25	6000	130	317.25	6000
Amazon Rubber Co., Akron, O.	15.95	29.15	30.85	37.70	39.50	46.95	49.30	49.30	70.25	2200	90	70.25	2200	90	156.75	4000	110	156.75	4000	110	156.75	4000	110	156.75	4000
Amazon Cord, non-skid	15.95	29.15	30.85	37.70	39.50	46.95	49.30	49.30	70.25	2200	90	70.25	2200	90	156.75	4000	110	156.75	4000	110	156.75	4000	110	156.75	4000
American Rubber & Tire Co., Akron, O.	18.75	34.00	36.00	43.75	45.25	54.25	57.50	56.75	82.65	2300	90	82.65	2300	90	148.70	4100	110	148.70	4100	110	148.70	4100	110	148.70	4100
American Cord, non-skid	18.75	34.00	36.00	43.75	45.25	54.25	57.50	56.75	82.65	2300	90	82.65	2300	90	148.70	4100	110	148.70	4100	110	148.70	4100	110	148.70	4100
Armstrong Rubber Co., Inc., Garfield, N. J.	15.95	30.60	32.40	39.60	41.50	49.30	51.00	51.75	86.00	2200	90	86.00	2200	90	156.00	4000	110	156.00	4000	110	156.00	4000	110	156.00	4000
Armstrong Super Size Cord, non-skid	15.95	30.60	32.40	39.60	41.50	49.30	51.00	51.75	86.00	2200	90	86.00	2200	90	156.00	4000	110	156.00	4000	110	156.00	4000	110	156.00	4000
Blekre Tire & Rubber Co., St. Paul, Minn.	33.45	35.40	41.95	43.90	52.20	54.70	54.70	54.70	97.50	2200	90	97.50	2200	90	156.75	4000	110	156.75	4000	110	156.75	4000	110	156.75	4000
Blekre Cord, non-skid	33.45	35.40	41.95	43.90	52.20	54.70	54.70	54.70	97.50	2200	90	97.50	2200	90	156.75	4000	110	156.75	4000	110	156.75	4000	110	156.75	4000
Braender Rubber & Tire Co., Rutherford, N. J.	14.65	29.15	30.85	37.70	39.50	46.95	50.55	49.30	81.35	2200	90	81.35	2200	90	152.00	4000	110	152.00	4000	110	152.00	4000	110	152.00	4000
Braender Bull-Dog Super, non-skid cord	14.65	29.15	30.85	37.70	39.50	46.95	50.55	49.30	81.35	2200	90	81.35	2200	90	152.00	4000	110	152.00	4000	110	152.00	4000	110	152.00	4000
Brunswick-Balke-Collender Co., Chicago, Ill.	16.50	29.15	30.85	37.70	39.50	46.95	48.25	49.30	80.45	2200	95	80.45	2200	95	146.65	4000	115	146.65	4000	115	146.65	4000	115	146.65	4000
Brunswick Cord, Flat Tread, non-skid	16.50	29.15	30.85	37.70	39.50	46.95	48.25	49.30	80.45	2200	95	80.45	2200	95	146.65	4000	115	146.65	4000	115	146.65	4000	115	146.65	4000
Burdick Tire & Rubber Co., Noblesville, Ind.	39.50	58.75	62.25	67.25	70.50	80.00	82.00	82.00	143.00	2200	90	143.00	2200	90	238.00	4000	110	238.00	4000	110	238.00	4000	110	238.00	4000
Air Bag Cord, non-skid	39.50	58.75	62.25	67.25	70.50	80.00	82.00	82.00	143.00	2200	90	143.00	2200	90	238.00	4000	110	238.00	4000	110	238.00	4000	110	238.00	4000
Canton-Blackstone Co., Youngstown, O.	20.00	33.45	35.35	43.25	45.30	53.80	55.10	56.50	82.65	2200	90	82.65	2200	90	148.70	4000	110	148.70	4000	110	148.70	4000	110	148.70	4000
Canton Cord, non-skid	20.00	33.45	35.35	43.25	45.30	53.80	55.10	56.50	82.65	2200	90	82.65	2200	90	148.70	4000	110	148.70	4000	110	148.70	4000	110	148.70	4000
Columbia Tire & Rubber Co., Mansfield, O.	17.60	29.15	30.85	37.65	39.35	46.95	50.15	51.75	81.45	2200	90	81.45	2200	90	152.10	4000	120	152.10	4000	120	152.10	4000	120	152.10	4000
Columbia Cord Giant	17.60	29.15	30.85	37.65	39.35	46.95	50.15	51.75	81.45	2200	90	81.45	2200	90	152.10	4000	120	152.10	4000	120	152.10	4000	120	152.10	4000
Combination Rubber Mfg. Co., Bloomfield, N. J.	14.90	22.90	24.60	30.65	32.65	37.60	40.05	43.30	74.40	2200	90	74.40	2200	90	133.85	4000	110	133.85	4000	110	133.85	4000	110	133.85	4000
Combination Vicking Fabric, non-skid	14.90	22.90	24.60	30.65	32.65	37.60	40.05	43.30	74.40	2200	90	74.40	2200	90	133.85	4000	110	133.85	4000	110	133.85	4000	110	133.85	4000
Combination Vicking Cord, non-skid	17.20	29.15	30.85	37.70	39.50	46.95	48.15	49.30	82.25	2200	90	82.25	2200	90	155.20	4000	110	155.20	4000	110	155.20	4000	110	155.20	4000
Dayton Rubber Mfg. Co., Dayton, Ohio	17.95	32.75	34.35	41.75	43.75	51.75	53.50	54.50	82.25	2200	90	82.25	2200	90	155.20	4000	110	155.20	4000	110	155.20	4000	110	155.20	4000
Thorobred Cord, non-skid	17.95	32.75	34.35	41.75	43.75	51.75	53.50	54.50	82.25	2200	90	82.25	2200	90	155.20	4000	110	155.20	4000	110	155.20	4000	110	155.20	4000
Empire Tire & Rubber Co., Trenton, N. J.	14.60	29.15	30.85	37.70	39.50	46.95	53.30	49.30	76.30	2000	90	76.30	2000	90	139.15	3650	110	139.15	3650	110	139.15	3650	110	139.15	3650
Empire Cord, non-skid	14.60	29.15	30.85	37.70	39.50	46.95	53.30	49.30	76.30	2000	90	76.30	2000	90	139.15	3650	110	139.15	3650	110	139.15	3650	110	139.15	3650
Erie Tire & Rubber Co., Sandusky, O.	15.95	29.15	30.85	37.70	39.50	46.95	49.00	51.50	76.50	2200	90	76.50	2200	90	136.00	4000	110	136.00	4000	110	136.00	4000	110	136.00	4000
Erie Cord, non-skid	15.95	29.15	30.85	37.70	39.50	46.95	49.00	51.50	76.50	2200	90	76.50	2200	90	136.00	4000	110	136.00	4000	110	136.00	4000	110	136.00	4000
Falls Rubber Co., Cuyahoga Falls, O.	19.50	34.00	36.50	43.25	45.75	60.00	62.50	65.00	92.00	2200	90	92.00	2200	90	160.00	4000	110	160.00	4000	110	160.00	4000	110	160.00	4000
Falls Cord, non-skid	19.50	34.00	36.50	43.25	45.75	60.00	62.50	65.00	92.00	2200	90	92.00	2200	90	160.00	4000	110	160.00	4000	110	160.00	4000	110	160.00	4000
Federal Rubber Co. of Illinois, Cudahy, Wis.	17.85	29.15	30.85	37.65	39.35	46.95	56.10	57.55	70.00	2200	90	70.00	2200	90	136.00	4000	110	136.00	4000	110	136.00	4000	110	136.00	4000
Federal Cord	17.85	29.15	30.85	37.65	39.35	46.95	56.10	57.55	70.00	2200	90	70.00	2200	90	136.00	4000	110	136.00	4000	110	136.00	4000	110	136.00	4000
Firestone Tire & Rubber Co., Akron, O.	12.90	28.55	30.75	39.60	41.50	49.30	50.60	51.75																	

[illegible]

NEW COMMERCIAL CARS



New Atterbury Trucks Contain Many Improvements

THE chief characteristics of the new Atterbury line, which has just been announced by the Atterbury Motor Car Co., Buffalo, N. Y., may be summarized in the careful attention to details and big changes in the engineering design.

The new series use the latest type Continental engine with pressure feed lubrication and removable cylinder heads. The engine suspension is of unusually efficient assembly, consisting of a full universal joint mounting as illustrated in the accompanying sketch. At the rear the en-

gine is carried by two universal joints connecting it with the frame, while at the front the crank case is supported by an exceptionally large bronze bushing in the center of a cast steel cross beam which in turn is supported by universal joints at each end. The result is protection against frame distortion in every direction without the use of coil springs or other similar mountings.

In the 1½-ton model the transmission is a three-speed gear-set mounted as a unit power plant. On the 2½, 3½ and 5-ton sizes the transmission is mounted

amidships. They are all four speed units with Timken bearings and center control. The suspension of the amidship transmission is worked out practically the same as the engine suspension. Twisting strains are claimed to be entirely absorbed before reaching the transmission case. Transmission gear ratios have been lowered so that increased ability is obtainable on intermediate speeds without sacrificing running speed in high. The 1½-ton model is rated at 20 m.p.h. on solid tires and 22 m.p.h. pneumatics. The 2½-ton operates at 18 m.p.h. on solids and 19.5 on pneumatics, while the 3½-ton has a speed of 15 m.p.h., and the 5-ton, 12.5. In each model speed is governed by a shaft driven centrifugal governor.

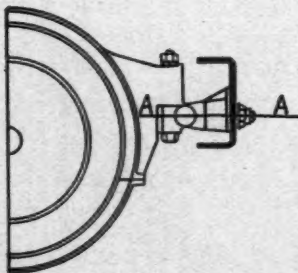
Spicer propeller shafts are used in all models, the 1½-ton having two shafts and three universals with a heavy-duty self-aligning ball bearing midway between the transmission and rear-axle. The shafts in the heavier models run from clutch to transmission and thence to rear axle.

Timken axles front and rear continue to be standard Atterbury practice. The flexible type frame is also continued. The frame is bolted throughout; not riveted. All models are now left hand drive with center control.

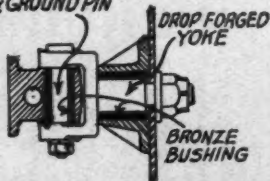
From the standpoint of equipment, the new models reflect the trend of the times.



Side View of the New 3½ Ton Atterbury, One of the New Models Recently Announced by Atterbury Motor Car Co.

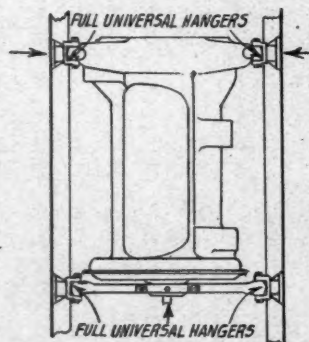


HARDENED & GROUND PIN



DROP FORGED YOE

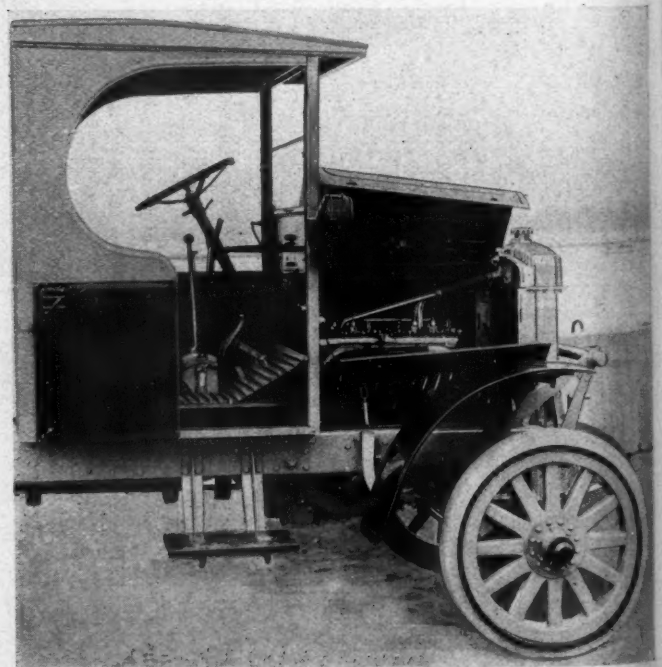
BRONZE BUSHING

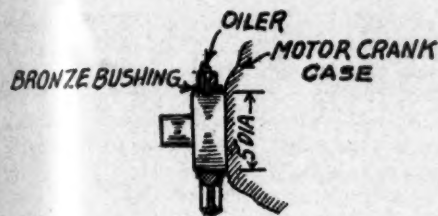


Above: Engine Suspension Employed in All the New Atterbury Models.

Left: Engine Rear Suspension and Section Through A-A.

Right: View of the Controls and Mechanism Under the Hood.



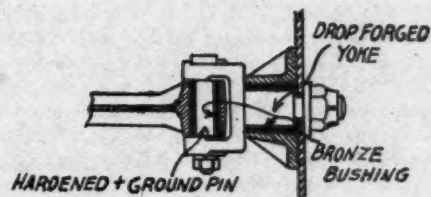


The 2½ and 3½-ton sizes are equipped with all-steel, semi-enclosed cabs with built-in windshield and doors. The other models are supplied with standard open cabs and curtains with enclosed cab listed as special equipment. Complete electric lighting equipment with heavy-duty lamps, storage battery and Delco generator is also standard equipment. It is no longer necessary for the Atterbury truck buyer to consider his lighting equipment as an extra item. The gen-



Engine Front Suspension

These diagrams show the front member with sections A-A and B-B, left and right respectively



erator is gear-driven from the camshaft gear and is incorporated right in the design of the motor. Provision is made for an electric starter, operating on the fly-wheel. Chassis lubrication is by the Alemite system.

New type hoods with removable side panels are supplied in the new models. They are especially designed for long life, absence of rattle and easy handling. Gasoline tanks are mounted under the seat and supply is by Stewart vacuum

tank to the Zenith carburetor. All of these refinements in design combine to make a smooth appearing and efficient job.

J. R. Spraker, vice-president and general manager, pointed out the fact that the Atterbury Motor Car Company specialized on motor trucks exclusively for twenty years. He also stated that the new models have been under test for two years in some of the worst sections of the United States.

Goodwin-Guildler 25-30 Passenger Coach

MANY distinct improvements have been incorporated in the recently announced Goodwin-Guildler 25-30 passenger coach. Revisions and improvements in the matter of safety, comfort and service were the prime factors considered in its designing. This new product which is now in production and ready for the market is offered by the Goodwin Car & Mfg. Co., Inc., 17 Battery Place, New York City.

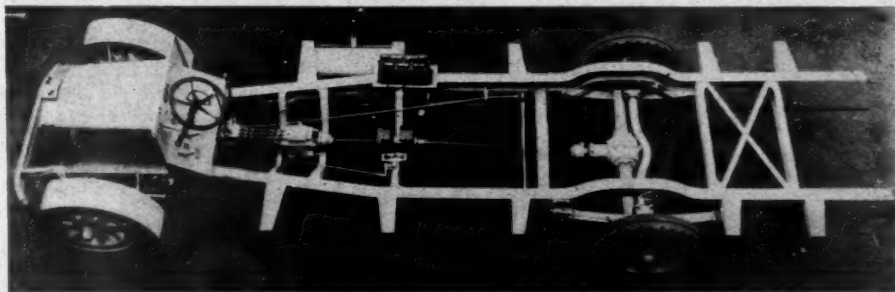
In addition to betterments along the lines of speed, economy of operation and mobility, other features include a low placed floor, which is only 18 in. from the curb line and requires but one step to enter; long flexible riding coach springs; a wide rear tread which prevents overturning and minimizes skidding; a low center of gravity, and cushion wheels and semi-pneumatic tires, together with comfortable seating capacity.

The special designing and equipment has given this job riding ability of smoothness similar to that of a carriage. Cushioning and resilience is such that the occupants are not bounced all over the interior.

The power plant is a special coach en-

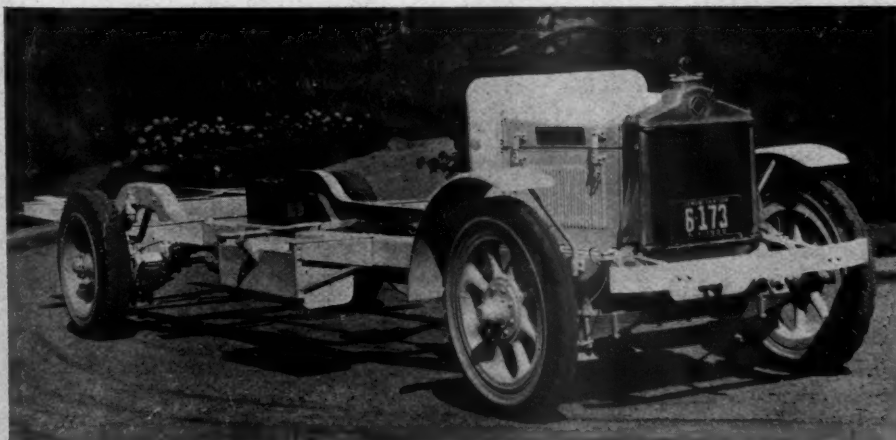
gine made by Buda Company. It's a Model EBU and is suspended from three points. The bore and stroke is 4¼ x 5½ in., respectively. This engine, built for higher speed than the regular truck engine, will maintain a speed of 1500 r.p.m. without danger. Water control is thermostatic and oil control, vacuum. Gasoline is fed to a Zenith carburetor by the Stewart system from a 30-gal., square type tank mounted under outriggers at the right side directly back of the front door entrance. Ignition is Eisemann.

From the engine power is carried through an oil type, multiple-disk, fully-enclosed clutch to a special transmission fitted with ground gears. This gear-set, mounted amidships, permitting easy removal, provides four speeds forward and one reverse, fourth being direct. A two-joint assembly is used between transmission and rear-axle supported by an SKF bearing mounted in a center bearing housing. A Merchant & Evans Griptite universal joint is used between the clutch and transmission and a Spicer between



The Chassis Was Specially Designed for Passenger Coach Service

Note the frame kick-up over rear wheels, outriggers, battery support and unit disposition



Three-Quarter View of the Recently Announced Goodwin-Guildler Passenger Coach Chassis

It was designed with a view of providing maximum passenger comfort

the transmission and rear axle. The rear axle is of special design and provides a 71-in. tread to take care of side sway. The front is also of special construction and of the drop type, providing an 8-in. clearance and a 64-in. track.

Semi-elliptic Merrill electric silico manganese steel springs, having auxiliary leaves to take care of overload, are used. On the rear springs three auxiliary leaves are used which do not come into action until two-thirds of the load of the truck has been installed. This is said to allow for as easy riding when the body is partly loaded as when fully loaded. The rear springs are 3½ in. wide and 60 in. long, underslung and straight under full load. The front springs are 2½ in. wide and 44 in. long, straight under full load.

Two heavy-duty brakes are provided on the propeller shaft. These are 5 in. and 11 in. in diam., operating through an

equalizer, which makes it possible to reduce the pressure per square inch on the lining. The bands are easily removable. The emergency brake is on the rear axle and is operated through a hand lever. Steering is through a Ross steering gear, having a special 20-in. wheel.

Starting and lighting is provided by a Leece-Neville set. With this set a compensator is used which will take care of the difference in the charging rate necessary between day time load and night load. It is possible to charge at a rate of 5 to 6 amperes to take care of the day load, and when the load is on the coach body at night, the generator will

increase its charging to the rate of 15 amperes to take care of the proper coach lighting. The control is entirely automatic. The battery used in connection with this outfit is a 12-volt, heavy-duty, 180-amp. hr. Willard.

The frame, designed specially for coach mounting, is wide at the rear and constructed with a kick-up over the rear axle to allow for low center of gravity. The wheelbase is 196 in. for a body 19 ft. 6 in. or longer; and 184 in. for a body 18 ft. 6 in. or shorter. The chassis is fitted with outriggers, the tops of which are flush with the top of the side rails. The body is mounted directly on these, pro-

viding a firm support for the extreme width of the body. When the chassis is fully loaded the front of the frame is 24 in. from the ground and the rear 26 in.

Other specifications include: Smith steel cushion wheels, semi-pneumatic cushion tires, 36 x 5 in. and 36 x 8 in., or pneumatics if desired; pressed steel dash, oil cups, wick system on all springs and other wearing parts, rubber shock bumpers on front and rear springs, and Timken taper roller type wheel bearings.

Tools and equipment include: heavy duty Dietz electric head and tail lights, complete set of tools and jack, Stewart electric signal, bumper and motor meter.

Weatherproof Tour-A-Bus Light in Weight

THE accompanying illustration is that of the Weatherproof Body Corp.'s Tour-A-Bus mounted on a Reo Speed Wagon chassis. It is in service on a bus line running between Owosso and Flint, a distance of 26 miles, and operated by Wayne Taylor, Owosso, Mich. The route which passes through several small towns is covered by five buses, the latest of which is this 25-passenger Tour-A-Bus. Wayne Taylor makes the statement by reason of the Tour-A-Bus body he is able to carry seven or eight more passengers on it than he could his other buses, the bodies of which themselves weigh about one-third more.

The design of this body, which is built in five standard sizes ranging from 11 to 25-passenger capacity for mounting on one- and two-ton chassis, fundamentally follows the idea of the open bus bodies so popular on the Pacific Coast. However, it contains other new features, the most prominent and desirable of which are the Weatherproof flexible sliding windows, which may be adjusted by passengers in accordance with weather conditions. When these windows are open the bus possesses all the advantages of a touring car, and when closed the body is weatherproof, tight and capable of being heated by the standard methods of engine-ex-

haust heating. The windows are fitted with clear heavy celluloid lights, which when raised slide out of sight on steel channels between the deck and its lining. Window construction of this type instead of the conventional glass construction is claimed to have made possible a deck construction of all-around lightness and eliminated top weight.

In describing its new job, the Weatherproof Body Corp., Corunna, Mich., places special emphasis on the factor of weight. The gross weight of the Tour-A-Bus is stated to be much below the weight of bodies of similar carrying capacity. There is a growing conviction that lightness of weight when accompanied by proper strength is one of the most important elements to be considered in the designing of a motor bus. Passenger comfort is assured by the use of deep Marshall type springs. The seats, which run across the full width of the body, are well padded and upholstered. The backs have coil springs in them. The spacing between seats is liberal, providing ample leg room. The rear section is also large enough to accommodate hand baggage.

Attention is also called to the front end construction. The sides converge to meet at the dash. This not only does away with an unattractive square front but also

permits of a slanting windshield and triangular side glass panels, all of which give the driver better vision both front and side.

Briefly, the floor is of grooved and tongued yellow pine set in sills and sealed at the joints. The frame consists of hard wood posts, bolted, screwed, glued and braced. Panels and doors are covered with 20-gage body steel. The deck is full slatted, extra padded and covered with artificial leather. Sufficient illumination is furnished by three dome lights mounted in the deck.

Dimensional specifications vary according to the capacity of the body. These may be obtained direct from the manufacturer.

Automotive Electric Association Discusses Problems

The making of better merchants out of the small town electric service men, the standardization of electric generators and the solution to the problem: "Who shall do the repair work on starting, lighting and ignition equipment, the car dealer or the electric service shop?" are some of the aims of the Automotive Electric Association, as brought out at the annual meeting held at Old Orchard, Me.

The last named question, involving the dealer and the electric shop, commanded the greatest amount of attention. The opinion of those in convention was very much divided, many believing that provided the merchandiser of cars had the proper equipment and possessed at least one good electrical man, he was the one to handle the work. On the other hand, due to the factor of specialized work, many felt that the electric shop should take care of the repair jobs. A specialized shop must have special machinery and tools and are in a better position to have expert workmen. In a small town the electrical work is at times not large enough to support a specialized shop.

During the meeting, it was stated that, in the small town, the man in charge of the electric repair shop, although an expert electrician, was frequently not a good merchant. It will be the aim of the association to better this condition.

Plans were suggested for the standardization of six sizes of generators which would be of great benefit to the manufacturer, who would not have to make a variety of sizes and to the repairman in simplifying service.



One of the Weatherproof Tour-A-Bus Bodies Mounted on a Reo Chassis, Now Operating on a Bus Line Between Owosso and Flint, Mich.

Hewitt-Talbot Low-Bed Motor Trucks Built in Two Models

THE Hewitt-Talbot low-bed motor truck, which is being built in two models by the Hewitt-Ludlow Auto Co., Inc., 149-151 Eleventh St., San Francisco, Cal., is radically different from the usual type of motor truck. In view of its usefulness and merit as proved by its satisfactory acceptance by draymen along the West Coast, where it now occupies an established place in the field of motor trucks, these special jobs should find an equally fertile field in the East, where draymen not only exist in greater numbers, but are confronted with a greater variety of drayage work. This job has a particular place in the equipment of draymen.

Telephone and telegraph companies could use it to great advantage in handling reels of cable, as the lift is only 24 in. from the ground. Foundries would find it utilitarian in handling heavy castings and machinery houses in handling machine lathes, etc. Paint and plate glass companies for large cases. It is also a very useful truck for handling goods at the docks and railroad terminals. The field is large. A low-bed truck of this type has a definite place in the field of transportation. The center of gravity being low, it is also very desirable for carrying oil tanks and other heavy bodies, thus reducing wear and tear and tires.

This low-bed truck is radically apart in design from the usual high-bed type. For this reason it has many points in its favor that appeal to the drayman and merchant engaged in transporting heavy merchandise. Cost of operation is stated to be comparatively low and the danger incident to the handling of heavy material is greatly reduced. Another feature is its easy and smooth steer. It can also capably negotiate congested traffic, narrow streets, and enter any doorway that a standard high-bed truck can enter.

The floor of the body is of large loading area, which is one of the first requisites demanded by a drayman. Although the bodies are mostly of the stake type, the company is in a position to build bodies to suit any particular line of business. And the chassis is otherwise well-balanced throughout and suspended on the best of springs. The cabs, windshields and tops are adapted to meet

the requirements of the type of body used. Another consideration not overlooked in the design of the truck was a good seat, making for the comfort of the driver.

The main units are as follows:

Buda engine, Brown-Lipe transmission and clutch, Modine radiator, Bosch high tension magneto and impulse starter, Stromberg carburetor, Stewart-Warner vacuum feed, Wohlrab and Ross steering gears, and Continental front axle. The rear-axle is of the drop type and the rear wheels are driven by chains from a jack-shaft of special design. Spicer universal joints and propeller shafts are used.

New Miami Fordson Trailer

THE constantly increasing use of the Fordson tractor in commercial hauling and other industrial work has created a demand for special hauling equipment designed to be used with it. To meet this demand, the Miami Trailer Co., Troy, O., has just announced a new special Miami Fordson trailer.

This trailer is of all steel construction except wheels and tires. It has a rounded load capacity of 2 yds., with provision for mounting a separate flared top box of ½ yd. or 1 yd. extra capacity for transporting materials of a total load of 2½ tons, but of greater volume than 2 cu. yd. With ample factor of safety, the carrying capacity is 2½ tons.

The body, which is of 10 gage steel, reinforced with heavy angle arms, is designed with a rear bottom dump door, so that the size of the opening may be controlled either to dump the entire load in one spot, or to spread the contents 60 yd. wide to any depth desired. The entire load dumps back of the axle and behind the wheels of the trailer. The load is practically balanced on the axle, sufficient weight being placed on the drawbar to prevent wear in the hitch connection. The special automatic hitch bolts on to the rear housing of the tractor. The Fordson is simply backed up to the end of the trailer drawbar and the

coupling is completed without pins or cotter keys. Only a slight upward pull on the drawbar is necessary to disconnect the trailer from the tractor.

Both release and winding levers of the trailer are placed at the right hand of the tractor driver. This eliminates the necessity of stopping to dump or spread the load, or to rewind the dumping door. Such flexibility of operation greatly reduces ton mile costs.

The turning radius is that of the Fordson tractor. The unit can be backed into any position or can be turned around easily on the sub-base of a road. This flexibility is important for operation in close places.

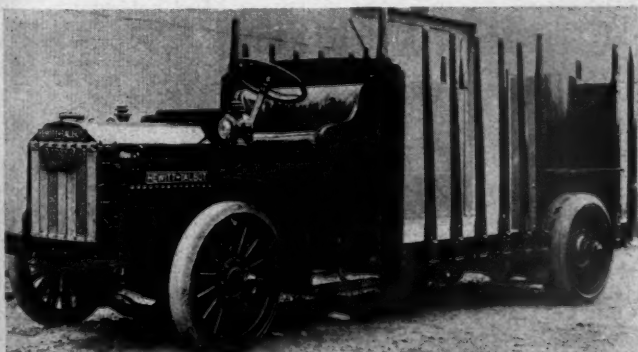
This new model Miami trailer, while designed to be used with the Fordson tractor, is equally well adapted for use with all other tractors with a drawbar rating similar to the Fordson. It can also be used on 2½ and 3-ton high speed trucks, as the equipment is mounted on Timken roller bearings and can be subjected successfully to the speed of the high speed truck.

Specifications are as follows:

Track .....	.60 in.
Axle 5 per cent nickel	2¼ in. square
Bearings	Timken roller
Wheels, artillery	36 x 5 in.
Tires pressed on	36 x 5 in.
Springs ..	.42 in. long, 3 in. wide, 11 leaves



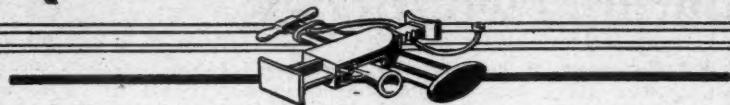
Below: This Low-Bed Job Serves a Distinct Hauling Field.



Above: The New Miami Fordson Trailer Can be Made to Spread Its Discharge.

Frame, rolled channel .....	.5 in.
Body, steel rounded load	2 yd.
Height, loaded .....	.64 in.
Height, unloaded .....	.65½ in.
Carrying capacity	2½ tons
Fordson hitch	Special automatic
Weight, complete	1960 pounds

TRUCK EQUIPMENT AND APPLIANCES

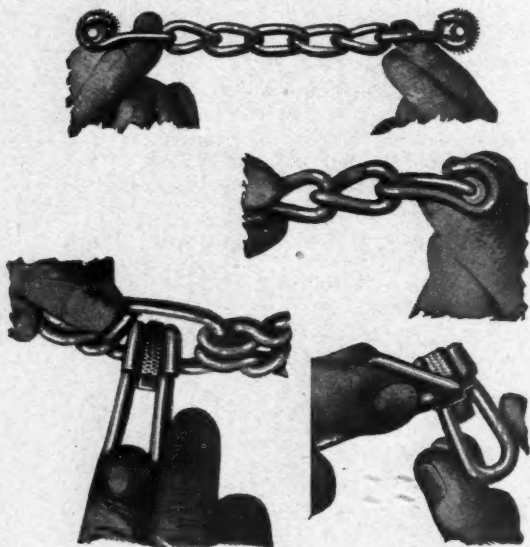


New Arrow Grip Chain for Pneumatics

The Arrow Grip Manufacturing Company, Inc., Glens Falls, N. Y., is marketing a new non-skid chain for pneumatic tires with several patented features.

The Arrow Grip Chain has a quick and easy cross chain replacement feature. The Cross Chain Fastener, a hook with a slotted button easily turned for detaching from the side chains, permits of ready replacement.

These fasteners and cross chains are also sold separately for replacing cross chains on other makes of chains. In using this fastener it is only necessary to



Illustrating the Facilities With Which the New Arrow Chains Can be Attached or Detached

turn the button until the slot registers with the opening in the hook. This permits removal from the side chain. Another turn of the button releases the broken cross chain. To put on a new cross chain the end link is placed in the slot. The fastener is again turned until the slot registers with the opening in the hook and the cross chain then falls into place. With the slot still open, the hook is placed on the side chain link and the fastener turned half way around to lock in position.

On account of the way the button in the fastener is made there is no chance for the chains to come unfastened either while in use or while lying idle in the car.

Arrow Grip Pneumatic Tire Chains are also equipped with a newly patented locking device which on account of the good amount of leverage given, is easy to operate, and gives a two inch "take-up" in fastening side chains. This provides a good fit and does away with the use of tire adjusters.

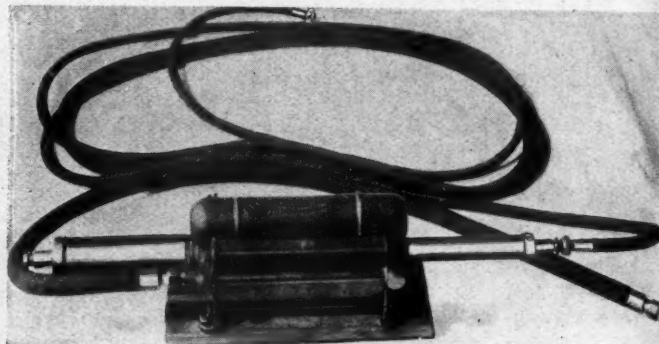
India Makes New Truck Tire

The tread of new double-oversize, extra-ply flat tread India cord truck tire, recently announced by the India Tire & Rubber Co., Akron, O., was especially designed for conformity to road surfaces. The broad, flat face which comes in contact with the road, is stated to wear slowly and evenly, and possess unusual traction and non-skid qualities. The heavy ribs on both sides of the tread afford additional protection against rut and curb-stone wear.

The tread stock has been brought well

Right: This Pump Can be Permanently Mounted or Used Portably

Lower: New Extra Ply, Flat Tread, India Cord Truck Tire.



down over the side walls, giving added strength to the carcass. The bead has been reinforced.

A special cushion and breaker strip construction is incorporated to distribute road shock to all parts of the tire, rather than allowing the shock to be absorbed by just those portions which are struck.

Whitted Vacuum Tire Pump

The Whitted Vacuum Tire Pump, manufactured by the Vacuum Pressure Products Co., Inc., Baltimore, Md., may be permanently mounted in any convenient place about a delivery or passenger car or it can be laid on the running-board for operation and when it is not in use can be stored under the seat or in the tool box.

The air is drawn in at one end of the low pressure cylinder, then compressed through the tubular shaft into the high pressure cylinder to approximately 30 lb.

per sq. in. It is then forced from the high-pressure cylinder to the tire to any desired pressure, averaging around 125 lb.

Throughout the air passages spring-seated ball checks are provided and oil-treated cup washers are used in all three pistons, the former being held against the side walls of the cylinder by expansion rings. Its weight is approximately 4 lb. and it measures about 16 in. length over all. Retail price, \$16.

Nims Pump for Ford and Fordson

A prominent feature in the construction of the Nims Pump, put out by the Nims Pump Co., Stockton, Cal., is its specially constructed bearing.

It will be noted from the accompanying illustration that instead of a shaft running straight through the bearing, an "end thrust" shoulder with a corresponding shoulder on the shaft is used. As water is drawn into the pump these two shoulders are pulled together, forming a closed bearing, thereby preventing escape of the lubricant and keeping the bearings free from all dirt and water that might otherwise get in from the water circulating system.

This construction, according to the manufacturer, makes the pump leak proof. The bearing is surrounded by water and is thereby water cooled. Other details are the specially designed impeller, which in addition to circulating



LONG BRONZE BEARING
Cutaway of Nims Pump, Showing
Specially Constructed Bearing

a large volume of water with little power consumption, permits the use of a 3-in. bearing in a 4½-in. pump, and the use of high-grade bearing bronze in its construction.

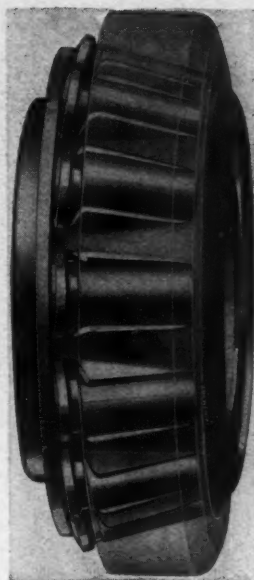
Improved Cage for Bock Taper Roller Bearing

In its new Taper Roller Bearing the Bock Bearing Co., Toledo, O., has combined increased strength with simplicity by reason of an improved cage.

In the new design, the cage and rollers are assembled with the cone as one unit, the cup being the second unit in the complete bearing, which formerly consisted of three parts. This makes for greater convenience in handling, and leaves less to the discretion of the mechanic.

Notable improvements in equipment have been made recently at the Bock Bearing plant, along with the improvement in the design of the product itself. Automatic gaging machinery is in use, and automatic taper grinders and head grinders, which have been in process of development for a long period, have been installed to replace the semi-automatic

machines previously used. This is claimed to greatly increase the productive capacity of the plant, as well as add to the quality of the product.



Phantom Shows
Relation of the
New Improved
Cage to the Rest
of the Bock Roller
Bearing.

Great Activity in Foreign Motor Bus Field

A Potential Market for the Sale of Motor Vehicle Equipment in the Immediate Future

THE popularity of motor buses is increasing to such an extent, says the Automotive Division of the Department of Commerce, that the market which is derived from the demand for such vehicles promises to become a vitally important outlet for automotive products. The world-wide growth of public automotive transportation is reflected in an increasing flow of reports to the Commerce Department from countries with a highly developed transportation system as well as from relatively unpopulated and undeveloped areas such as the Near East. In the course of one week reports on motor bus operations from London (Ont.), Geneva, Damascus, Alden, and Melbourne have reached the Automotive Division.

Bus Popular in Damascus

Bus passenger transportation in the Damascus region (Syria) has increased very much in importance during the past six months. The Beirut-Damascus railroad, was up to a short time ago charging three Syrian pounds (\$5.00) for a third-class railway ticket to Beirut (86 miles by rail), and as the same trip could be made in about half the time in an auto bus for two Syrian pounds (\$3.30), the business of the railway company fell off alarmingly and did not improve when the price of a third-class ticket was decreased to pounds Syrian 2.10 (\$3.45).

As a result the railway company inaugurated a motor bus service of its own, the price of a ticket on which is Syrian 1.25 (\$2.05).

Consul Taggart, London, Ontario (Canada), reports that the fares charged by the street railways there until the Spring of

1922, were regarded the lowest in Canada and in the United States. Last Spring the fares were raised but this increase did not result in any profit to the street railway companies because of the operations of motor buses which began at about that time.

The bus rates are somewhat lower than those of the street railways although the former are obliged to pay the city a license fee of \$100 for each bus. They furthermore are compelled to take out a liability insurance to cover payment of damages for injuries to persons or property.

Geneva Plans Big Bus System

Consul Haskall, Geneva, Switzerland, reports that Geneva is the first Swiss city to carry extensive plans for the adoption of auto buses. A company has been formed for the purpose of operating three lines, the concession for which, is anticipated, will be granted shortly. The cars for the new bus lines will be similar to those used in Paris, only somewhat smaller with a total capacity, including that of the rear platform, of thirty-five passengers. The buses, which will be equipped with pneumatic tires, will be furnished by the Saucer Company, of Arbon.

The introduction of bus lines is apparently not so much in response to a need for more extensive transportation facilities, but rather a venture in underselling the tram lines, 15 of which constitute the present system, embracing a length of 119 kilometers. The rates announced by the bus company are appreciably lower than those of the trams.

Consul Raymond Davis, Aden, Arabia, reports the conversion of taxicabs into buses in Aden, Arabia, as an unusual de-

velopment caused by a ruling recently passed compelling taxi drivers to assemble their cars in certain prescribed taxi stations, and to wait there for passengers, leaving in order of priority instead of running up and down the streets soliciting business as has been their custom heretofore. To make matters worse for taxi drivers there were several automobile trucks following a more or less fixed schedule and route to which the above ruling does not apply. These buses carry three or four times as many passengers at about one-half the rate of the taxis and are very popular since most of the natives in Aden are of limited means.

Bus Transportation Monopolizes

After an unsuccessful appeal to the authorities taxicab drivers started about one month ago to change their cars into buses, of which there are now six in running order and several more in the course of construction. The bodies to fit the buses are made locally and at a comparatively low price.

Owing to the congested condition of traffic in the central sections of the city of Melbourne, Australia, says Consul General Sammons, it has been proposed that motor buses, similar to those used in London, be put in service at the earliest possible moment.

Trucks for Arizona Cotton Labor

Several thousand cotton pickers are being dispatched by motor truck from Nogales to Phoenix and other Salt River Valley cities in Arizona. Food is provided en route and the laborers are carried directly to the plantation where they are to work.



SERVICE AND REPAIR DEPARTMENTS



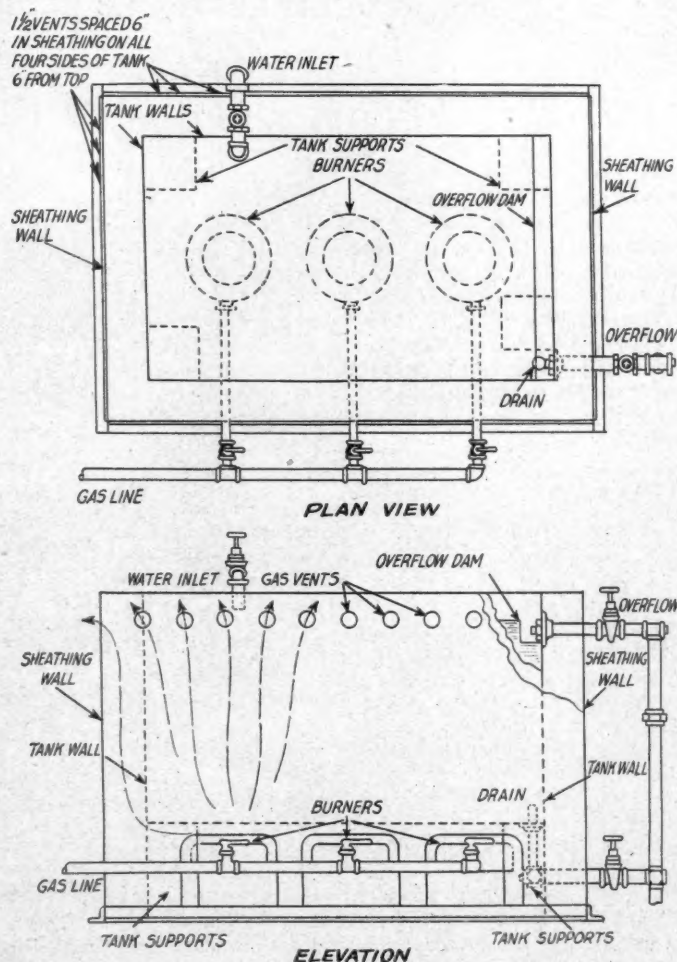
Cleaning of Parts an Important Factor in the Reduction of Repair and Overhead Cost

*The Tin-Can and Brush Method is No Longer
in Vogue in the Shop That is Trying to Give
Its Customers the Most Value for Their Dollar*

ARE service men hide-bound by convention? When we consider the progress made by the automobile industry during the past ten years it is astonishing to note that in other respects we are still doing business in the same old way. When the writer served his apprenticeship in the repair shop he was started in as a grease ball—as usual. He was given the pleasant task of removing grease and dirt from units and their component parts and cleaning them. Many an hour in those days the writer spent with a pail of gasoline and a brush. And gas was not charged to the customer in those days, for it was purchased at about 7 cents the gallon. The labor charge for skilled mechanics in those days was about 60 cents an hour and some shops charged 50 cents. The 'grease ball' was paid so little (he was learning the business, and knowledge was in those days considered a compensation) that only a small per cent of the shops charged for the services of the helper. How different it is today!

Antiquated Methods Still Obtain

Noting a mechanic dabbling at a differential assembly with a brush and gas the other day, and taking his time at the work, set the writer to won-



Details of an Arrangement for Heating Cleaning Liquid, Which is Inexpensive to Install and Operate. This System is Popular Where There is No Gas Supply

dering if we have made the progress in service we think we have in the past few years. So the writer made it a point to check the cleaning methods in various service stations during his travels and was astonished to note that we are still doing business in the same old wasteful and expensive manner, namely, with the brush and a pail of gas.

In one large service station, which will serve as an example for the majority, there was a chassis that was in the first steps of a complete overhaul. A mechanic was seated on a box prying chunks of grease from the differential housing, and his movements made me think of those slow-motion moving pictures. I spent a few hours with the service manager and, again visiting the shop, noted that the mechanic was still on the job. So I asked him how long it would take him to clean all components of the axle, including the bearings. "Oh, I dunno," was the reply. "Never kept run of it. Mebbe four or five hours. I dunno, Why?" "Merely curiosity," I replied.

Just Charge It to Customer

Next I asked the service manager how long it would take to clean every component of the chassis and what would be the labor and gas charge. The service head

didn't know. Said the gas was charged up and the labor all went in on the job. Didn't know what the cost was, as he never kept any record of it. It was labor, wasn't it, so what's the difference?

I asked this service head who paid for the waste and rags for wiping the parts after they were washed. "Why," he said, looking at me as if I had asked a foolish question, "they are taken care of in the overhead." So it developed that the labor rate per hour included the rags, so I then asked why shouldn't the cleaning of the parts be included in the overhead also.

"Look here," he said, "don't you know the gas costs us 26 cents the gallon and that we will use five or ten gallons on that job? That's \$2.60. We pay that man 60 cents an hour to which we must add the overhead. Now you suggest we make the customer a present of over ten bucks! Where do you suppose we'd get off if we had two such cleaning jobs a week?"

But I came back with the suggestion that perhaps the charges for cleaning were too high, that if the man consumed only six hours and used but five gallons of gas the customer would be nicked just \$7.40. It ought to be done much cheaper and quicker. So all this leads up to the crux of this article, "Are Service Stations Giving the Customer a Square Deal When They Charge Gas and Labor for Cleaning?"

What About Idle Time Costs?

The writer cannot quote figures on the cost of fuel and labor for properly cleaning every component on a complete overhaul of a standard type of chassis, but it must run into a considerable sum—FOR THE OWNER TO PAY, to say nothing of the cost to him for the IDLE TIME OF THE TRUCK. My idea of first class service with trucks is getting any and all work done as fast as good work will permit, so that those charges which work when the truck cannot will be as small as possible. I'll venture to say that the truck owner having that complete overhaul would rather pay the service station \$10 for cleaning—IF—the work could be done in one hour, for the owner would save at least five hours idle time, i. e., he would get his truck that much quicker. But the same owner would be more vastly pleased if the work was done at a charge of less than \$2 and the time was also saved. And it can be done, but not with the old brush and gas method.

Why Not Factory Methods?

But it can be done by practicing the factory methods. The truck factory would have to increase the cost of a chassis if it employed a mechanic with gas or kerosene to clean the parts. Manufacturers discovered some time ago that for the majority of the cleaning work that some form of a liquid solution in which the parts were immersed was not only much quicker and better but considerably cheaper. With many of the operations it is absolutely essential that the parts be thoroughly clean. For example, ball and roller bearings when removed from the chassis should be so cleaned that no particles of dust or dirt remain

for, traveling as bearings do at a high speed, dirt functions as a very active abrasive. I have had a number of bearing engineers inform me that many of the alleged bearing faults were due to improper cleaning. The same will apply to a number of other components.

If the service manager will make a careful study of modern cleaning methods he is quite likely to discover that the gas and brush is not only inefficient and costly but, as previously pointed out, involves too big a time factor. And it contains the human element, i. e., the mechanic who will not make sure that the gas is sufficiently clean for the work in hand. This brings us to the water solutions. Caustic soda and lye have been and are used but these have their disadvantages. The soda solution gives off fumes and both invite danger of burns.

Simple Cleaning System

In a booklet on cleaning distributed by the Oakley Chemical Co., 22 Thames St., New York, there is set forth modern methods of cleaning in service stations by the water solution. The brochure deals with cleaning parts, radiators, paint, japan (also baked on), washing chassis and bodies, cleansing waste and rags and floors in the service station, garage and repair shop. The principle is a simple one. It involves some form of a tank which is filled with water to which is added a certain amount of Oakite, and the solution is heated to a certain number of degrees. The parts to be cleansed are dipped in the solution.

One of three forms of heating the solution may be employed, namely: steam, coal or gas. The use of high pressure steam is recommended but inasmuch as the average service station is equipped with low pressure steam it is not so practical as coal or gas. Gas is suggested. It is said by the engineering department of the Oakley Chemical Co. that a number of concerns specialize in gas equipment for heating the solution and that the cost of maintaining the proper heating temperature of the solution for eight hours is 6 cents. That of steam is said to be 8 cents. The gas plant can be started easily and regulated.

For the medium sized and small service station a tank of 100 gal. capacity will meet requirements but if large units, such as an axle, are to be cleaned a larger tank should be employed. Where large tanks are used it is recommended that a short overhead trolley with block and chain hoist be installed for handling heavy parts and baskets filled with the smaller parts. A fixed overhead block and fall can be used, but is not so convenient. The cost of equipment and installation is approximately as follows for the described equipment:

Tank—2 ft. x 2 ft. x 4 ft. long, No. 10 U. S. Standard Sheet Steel. Welded seams with 1-in. x 1/2-in. angle iron reinforced top. Total capacity, 120 gals., working capacity, 80 gals....	\$25.00
2 Atmospheric Burners, each of 80 cu. ft. per hour capacity.....	14.00
Installing tank with drain, overflow and water connections, brick foundation, burner mountings and gas connections, sheet steel sheathing, etc. Time and material	20.00
Total	\$59.00

2 Perforated metal baskets, 18 in. x 36-in., block and chain hoist and overhead trolley. Estimated roughly without securing quotations.....

Chemicals for make-up and upkeep of 80 gals. of solution for one year, based upon our experience with our own materials, will amount to 380 lbs. of Oakite Platers' Cleaner at 13 3/4c per lb.—\$50.82, plus freight from New York, approximately.....

Gas for heating 80-gal. tank 500 cu. ft. per day, with fuel value of gas at 600 B. T. U. per cu. ft. or 156M cu. ft. per year if tank is heated 8 hours per day. Normally about 50% of this quantity would be consumed. 70M cu. ft. at \$1.50 per M.....

The cost of the gas is placed at a high figure, as the fuel value is normally about 10 per cent lower than 600 B. T. U. per cu. ft. If steam of 25 lb. pressure were available, the equipment required would consist of a steam coil containing 18 ft. of 1 in. black iron pipe with valves, return bends, etc. A rough estimate, cost of material and labor for building and installing such a coil would be \$15. Cost of heating 50 per cent of time would be 25 cents per week or \$13 the year. The size and type of equipment will depend, of course, upon a number of factors.

The Real Factor is Costs

It would appear from a study of cost figures submitted the writer by the field engineers that any service station charging \$2 or more on the average per day for all cleaning, chassis parts, can consider a modern cleaning system. The equipment described with solution, fuel and baskets, amounts to \$267. The annual cost of operation, fuel and renewing the solution is about \$175 the year. It is claimed that one man can clean, or rather operate the tank, in one-twelfth the time required by the gas and brush method. Allowing for depreciation and interest on the investment the cost per day would be less than \$1.

Going back to the service station early referred to in the article, we shall assume that he spent six hours and used 5 gal. of gas, a total cost to the owner of \$7.40. With the tank method accomplishing better results in one-twelfth the time or one hour, and the daily cost of equipment, etc., at \$1, we would have a charge against the job of one hour labor at 1.25 and \$1 for equipment or a total of \$2.25. It would save the customer \$5.15 plus five hours' idle time which, after all, is the most important factor in service. Also the mechanic would have five hours to use on some other job, which would mean another job would be gotten out more quickly.

Does the Owner Know?

How many owners really know that in the hours for labor is included a charge for cleaning the part? True, the labor charge very frequently does not mean a large sum, for the average jobs are not complete overhauls, and the cleaning may be performed fairly readily by the old method. But if the owner has a number of jobs in the course of a year, and we all know that cleaning must be done before inspection and reassembly, does it not mean many dollars a year? There is not such a big difference in the cost

of gasoline and kerosene, and charging up 5 gal. or \$1.40 on a job that should only be charged at a few cents, is not reducing service costs to the owner. Of course if one is trying to find work for the mechanics, the gas and brush method helps out, but it does not materially assist the truck owner or boost service. Truck costs, service costs, must come down. Not necessarily by using cheaper labor but by employing better labor and methods which reduce the time factor.

Some owners do know. A friend of mine operates three trucks and has owned passenger cars ever since the first one was made to run. He is a manufacturer and his plant has a tank cleaning system. One day he dropped into the service station of the dealer who sold him

the trucks to see how an overhaul job was progressing. He noted a mechanic seated on a box jabbing at a crankcase with a brush and gas. Being keen on costs my friend casually asked the wielder of the brush if that was the way they cleaned parts. It was. The next question was, did the shop charge for cleaning? "Sure," said the mechanic, "we get \$1.25 the hour and 28 cents for gas." My friend waxed real peevish, told the service manager to send all parts to his (truck owner's) plant and he would do the cleaning a darned sight cheaper and better. Suppose every truck owner followed costs as carefully, wouldn't the service departments be in more trouble than they are now?



Details of the Front End Mounting

Selden Railroad Truck a Success in Georgia

THE Georgia Railroad & Power Co. is now working on its fourth great hydro-electric development. This is the Tugalo river dam and power plant, which, when completed, will add 43 per cent to their hydro-electric output,—88,000 additional horse power.

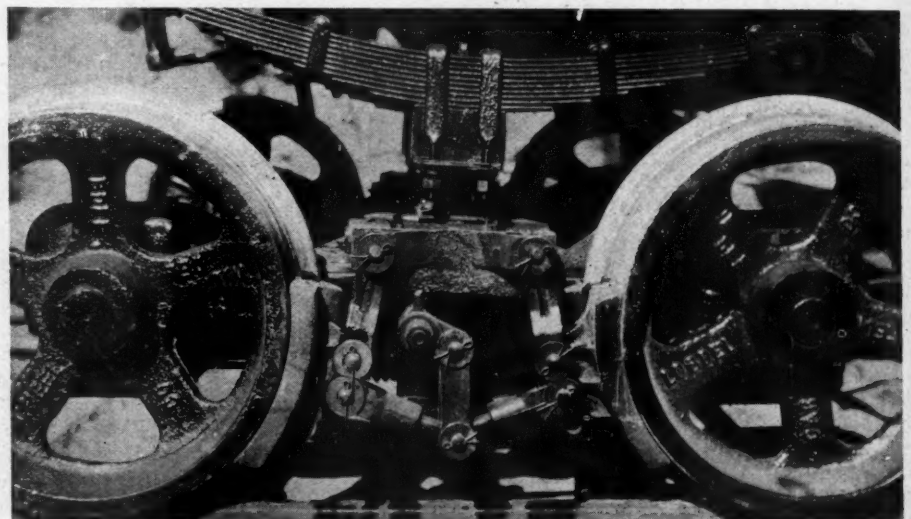
The building of this enormous dam was estimated to take two years, hence 1000 men with their families were moved to the site. This migration formed quite a village on the banks of the Tugalo river. Since this village and dam site is situated about 12 miles from the main line of the Southern Railroad, some means of transportation had to be devised.

The problem was finally solved and this distance is now covered by a standard gage railroad on which is operated a railroad truck. It is a model-70 Selden, equipped with cab and stake and rack body.

The front of the truck is mounted on a four-wheel pivotal pony truck. The rear wheels are regular wooden truck wheels fitted with steel locomotive tires. The steering gear of the truck is connected to the hand brake rigging which acts on the front wheels. Thus the foot brake

functions on the rear wheels while the steering wheel applies the special brake on the front pony trucks.

The truck pulls regular freight cars,



Showing the Spring Assembly and Positive Braking Action of the Braking Mechanism, Which Actuates on the Four Wheels of the Pony



The Track Works Through a Scenic Section. Trestle Bridges Are Employed to Span Low Places

flat cars equipped with seats to carry passengers and any freight that is to go to the Tugalo Dam. The track works its way through a very beautiful section of the country and the truck travels fully fourteen miles before reaching the Dam site.

It has proven very successful, reducing transportation costs over the spur line and releasing heavier locomotives for work on the main line where they are needed.

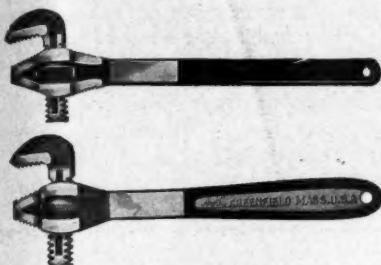
The town of Jennings, founded about twenty-five years ago, is being moved today by motor truck to Cadillac, Michigan, a distance of 11 miles. The houses to be moved vary in size from 24 by 30 ft. to 24 by 40 ft. The 11-mile trip is made in about four hours.

Service Station and Repair Shop Appliances

Little Giant Pipe Wrench

The "Little Giant" pipe wrench, a new wrench containing several interesting improvements, was recently put on the market by the Greenfield Tap and Die Corp., Greenfield, Mass.

It has the "end-opening" feature, which is particularly advantageous in pipe turning operations. Another feature of this tool is the ease with which it can be manipulated in confining quarters. It can be set straight on a pipe in the same manner in which pliers are used, instead of fitting the jaws on from the side. It



Two Sizes of the New Wrench Lately Announced by the G. T. D. Corp.

consists of three parts, a handle and jaw drop-forged in one piece, a movable jaw likewise drop-forged and a hardened steel nut. Strength is one of the main characteristics of this wrench.

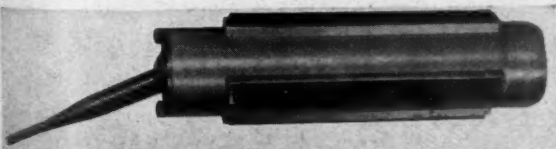
The 14-in. size is said to be able to withstand stresses in excess of 4700 in. lb. without slipping or bending.

Another feature is the double set of teeth on the main jaw. The movable jaw can be engaged at the option of the operator with either of these sets of teeth. On the large sizes, 14-in. and greater, two additional sets of teeth are provided, making four in all, and the movable jaw can be reversed to engage these additional sets of teeth, which are below the adjusting nut. This is very useful in connection with certain classes of work, besides practically quadrupling the life of the tool. The wrench is being manufactured in 8, 10, 14, 18 and 24 in. sizes, of which three smaller sizes are already on the market.

The Auto Hone

The Auto Hone put out by the Auto Hone Co., Inc., 1587 Main St., Buffalo, N. Y., is designed to regrind cylinders without removing the engine block from the frame. It is adjustable to the various sizes of cylinders, and is specified to remove fifteen thousandths in thirty minutes, and to make out-of-round or tapered cylinders perfectly straight.

It can be operated by hand, under a drill press, or by an electric drill. The latter is most preferable. Price, \$95.

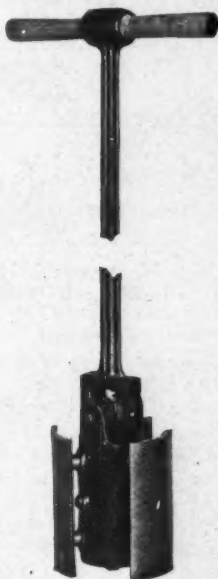


The Auto Hone is a Device Designed to Regrind Cylinders Without Removing Engine From Frame.

Hutto Cylinder Lap

L. Lawrence & Co., 6445 E. Jefferson Ave., Detroit, Mich., is offering to the repairmen of the trade a time saver known as the Hutto Cylinder Lap. This tested universal tool is designed for lapping cylinders for receiving oversize pistons and removing slight scores or scratches without the expense of dismantling. The purpose of this tool is not to eliminate cylinder grinding, but rather to correct the many small faults developing in a cylinder wall after a period, such as scoring, scratches, taper and out of roundness.

This tool is constructed with detachable jaws and possesses a wide range of adjustment. Adjustments are of a perma-



This Tool is Designed to Correct the Many Faults Developing in a Cylinder Wall After a Period of Service

nent nature, remaining unchanged when once set until changed by the operator. The lap jaws are of special composition metal, which is stated to be better than lead. It is described as being soft enough to permit an abrasive to imbed itself, and hard enough to hold it. This results in a permanent loaded lap after being used for a short time.

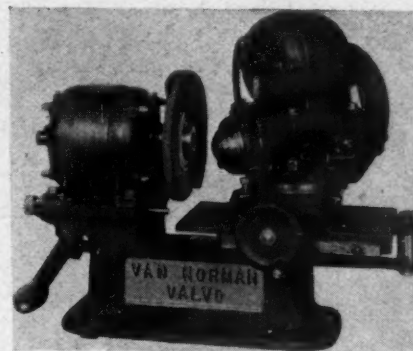
The tool is universal, for after a block which had been reground or rebored is lapped out with this tool the fine ridges which still remain are entirely obliterated, leaving a perfect glassy finish.

The Hutto Cylinder Lap with one set of lead jaws is \$15. Four additional sets of lead jaws taking all bores from 2 13-16 in. to 4 1/8 in. in diameter are also provided. Extra jaws sell at \$3 each per set.

Valvo Service Station Tool

The Van Norman Machine Tool Co., Springfield, Mass., announces a new self-contained machine, known as the Valvo, for the grinding of engine valves, etc. Use of belts have been entirely eliminated, a constructional feature that not only makes for a more effective drive, but reduces the possibilities of accidents as well.

Both the work head and wheel head have an individual motor for power and the parts are mounted on a substantial base. The grinding wheel is mounted



This Self-Contained, Beltless Machine is for Grinding Engine Valves

directly on the shaft of a 1/2 hp. ball-bearing motor, revolving at 3450 r.p.m., and is rigidly attached to the base of the machine.

The work-head spindle is driven by gearing from a 1-20 hp. motor, the whole work-head being carried on a movable slide operated by a convenient handle at the left. The valves are held by the stem in a split draw-in collet of a capacity up to 9-16 in. diameter. After the valve has been tightened in the draw-in collet and the work-head, which has graduations up to 60 deg., is set at the proper angle, the grinding is done by passing the valve across the face of the wheel, with a back and forth movement of the handle at the left, while the work is fed into the abrasive wheel in the hand-feed wheel at the right.

The face of the valve is ground true to the stem and its running position on the motors. It is stated that the average valve can be reground within one minute. The reamer for the valve seat can be ground at the same setting. This double-purpose feature insures a proper and correct seating of the valve.

In addition to grinding valves the machine is well adapted for several other useful operations about the service station. The tool embodies the best practice in machine tool design and is built with care and accuracy. Regular equipment includes one split chuck and a diamond with holder for truing wheel, re-seating reamer and one wheel, also a finger and holder for sharpening re-seating reamers.

Three New Stevens Products

To put an oil-groove on pistons and to drill oil-return holes in the oil-grooves is the purpose of the Stevens Oil-groove tool. It is designed not only for chamfering an oil-groove, but also to serve as a jig for drilling the oil-return holes.

This tool chamfers the lower edge of any groove in the piston at the correct angle. The cutter is made of high grade tool steel and has proper clearance to obtain a smooth cut. A stop provided in the feed screw prevents accidental deep cutting. For cutting, the piston is disassembled, inserted and operated as illustrated.

One of the steel jaws of the device is designed as a jig to drill the jig holes. The face of the tool is marked with spacing divisions for locating the holes at any desired intervals. Pistons prepared in this fashion are claimed to cure the most



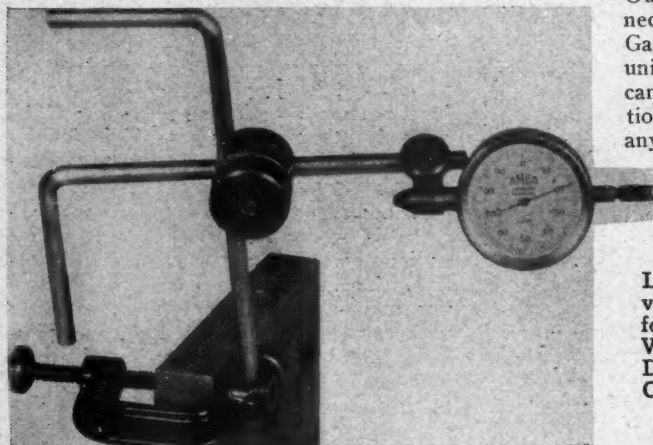
Stevens Oil-Groove Tool. It Chamfers Grooves and Serves as a Jig



This Tool is Designed to Facilitate the Removal of the Drive Shaft Sleeve

persistent cases of oil pumping and its application is said to require only about ten minutes to a piston. The price of the tool is \$9.50.

The Stevens Puller and Driver is a tool designed to facilitate the removal of the drive shaft sleeve. The puller has steel jaws that completely surround the sleeve, so that any required pressure can be applied through the large steel screw without injury to either the sleeve or shaft. The inside is machined to a close fit on the sleeve to prevent the tool from spring-



Left: The Ames Universal Attachment. It is for Use in Conjunction With the Ames Junior Dial Cylinder Gage Outfit.

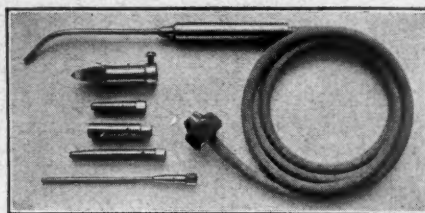
ing out of line or jumping off under pressure. The square bosses on the sides are for securing the tool in a vise. The Puller lists at \$6.50.

The Stevens Driver is provided with a "sight," consisting of a special notch and pin, which is claimed to insure the proper alignment of the keyway slots as the sleeve is driven into place. It is stated that it drives the sleeve with absolute safety. The tool is turned from steel rod. The price is \$2.

The Torit No. 13 Torch

The Torit No. 13 Torch is described as employable for numerous soldering, heating and light brazing jobs with speed and efficiency. It is made by the St. Paul Welding and Mfg. Co., St. Paul, Minn.

The outfit consists of a torch about 10 in. long, a set of four tips, one of which is made especially long and slim for radiator and battery repair work, a soldering copper which clamps over one of the



This Outfit for Numerous Soldering and Brazing Jobs is Completely Equipped

tips, five feet of rubber hose and a connection for the Presto or Searchlight auto acetylene tank.

With the long tip, the mechanic can work between the fins of a radiator and solder up a leak without cutting away the fins. With the large tip he can heat a 2-lb. soldering copper in about a minute or braze a steel bar $\frac{1}{4}$ in. diam. Price, complete as shown, \$7.50.

New Ames Attachment for the Ames Junior Dial Cylinder Gage Outfit

The B. C. Ames Co., Waltham, Mass., recently brought out the Ames Junior Universal Attachment, which has been designated for use in conjunction with the Ames Junior Dial Cylinder Gage Outfit. When used in connection with the Junior Dial Gage Head it provides a universal testing outfit that can be clamped in any position permitting gaging at any angle.

With this attachment the adaptability of the outfit to gaging requirements includes showing straightness of crankshafts, camshafts and valve stems, checking lift of valves and valve cams, and indicating the thickness of all materials such as shims, bearing liners, etc. It will also give the diameter of pistons and point out the truths of flywheels, gear box, shafts and angles. Prices: Attachment, \$5; Junior Dial Gage Head, \$10; Junior Cylinder Gage Mount, \$5.

Viking Products

All the wrenches manufactured by the Viking Speciality Co., 25 Bartlett St., Worcester, Mass., are stated to conform to machine tool standard in both material and workmanship. They are machined from high carbon bar stock steel, heat-treated throughout for toughness. A guarantee against breakage and as to satisfaction in the performance is claimed for them.

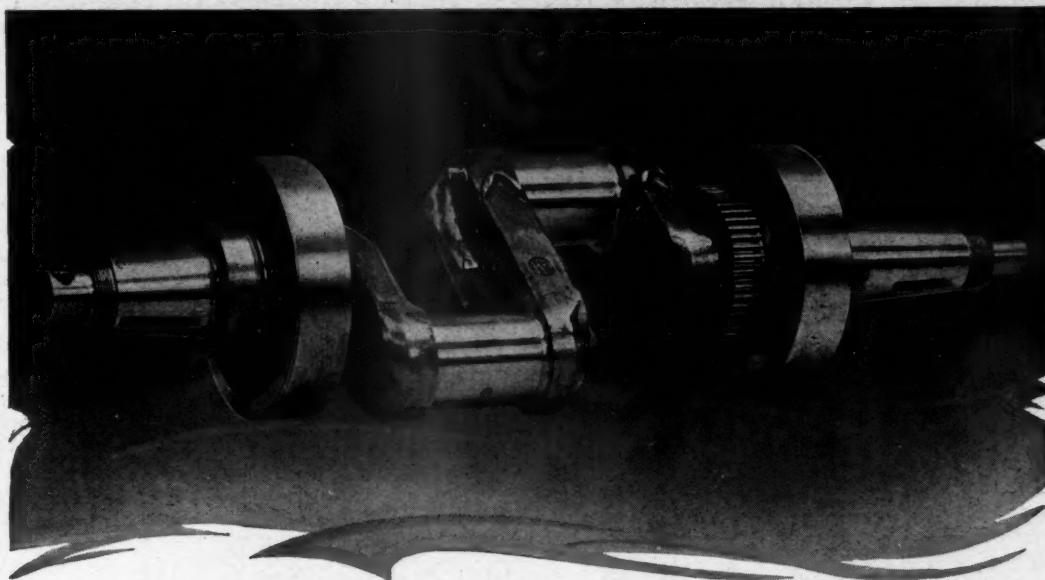
The Viking ratchet is said to possess the same degree of tensile strength contained in the steel of the sockets and handles.

The Viking Master set provides 193 wrench combinations, which is sufficiently complete to accommodate practically any requirement. The Ford special wrench replaces five single-purpose wrenches and does the work quickly and efficiently. The general service set illustrated herewith consists of 24 pieces and is particularly adapted to garage and service station work where many types and sizes are necessary. The price is \$15.

The Viking Master wrench also illustrated is designed to work in combination with all other Viking wrench parts, as a ratchet, speed and rim wrench. The ratchet has the same strength at the ratchet point as elsewhere throughout its construction. The price is \$4.



Showing a Separate View of the Viking Wrench, Bringing Out the Ratchet Feature, and a View of the Complete Set



Ball Bearings on Crankshafts Eliminate The Heavy Cost of Bearing Adjustment

SO SUCCESSFUL has been the application of deep-groove ball bearings on crankshafts that they are not only used extensively in automobile engines but on the crankshafts of Diesel engines up to 500 H. P. as well.

Experience has shown that ball bearings properly applied to crankshafts will operate with practically no wear over a period that should be equivalent to several years of truck operation. Even if after this period it should be considered necessary to install new bearings, this replacement

can be done readily without necessitating the regrinding of crankshafts, scraping-in of bearings and careful adjustment as is necessary with plain bearings. This means that the car owner is saved the cost of the heavy dismantling expense that is necessary when making bearing adjustments or renewals.

Insure the reputation of your car by equipping crankshafts with deep-groove ball bearings as made by The Hess-Bright Manufacturing Company.

THE HESS-BRIGHT MANUFACTURING COMPANY

Supervised by **SKF** INDUSTRIES, INC., 165 Broadway, New York City

812



Races displaced to show DEEP-GROOVE bearing carrying maximum end thrust in a forward direction.

Races displaced to show THE SAME bearing carrying maximum thrust in reverse direction.

BALL BEARINGS
The Highest Expression
of the Bearing Principle

THIS SYMBOL IN ANY ADVERTISEMENT MEANS: SEE "CHILTON AUTOMOBILE DIRECTORY" FOR COMPLETE BUYING INFORMATION

Activities of the Motor Truck Association of Philadelphia

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THE COMMERCIAL CAR JOURNAL OFFICIAL ORGAN

THE season's first monthly get-together of the Motor Truck Association of Philadelphia was given over entirely to an evening of Bohemian jollification.

As an innovation, the speeches were all curtailed, as Thomas Quirk, president, announced that they wanted the members to get acquainted and have a good time. A vaudeville and musical entertainment was provided by Arthur Bit-tong and others of the entertainment committee.

Fred H. Williams, of the White Company, Chairman of the Legislative Committee, reported that at the next meeting they would have some important data to lay before members regarding the License

Fee Question. He also discussed the Used Truck Problem, which he thought was an individual matter for each distributor to solve for himself, as he did not believe any general rule of practice could be put in force in fairness to all. He admitted that it was a difficult problem to solve, but said he had never found a panacea for its cure. He stated that he believed the owners of Used Trucks must find a market for them the same as any other merchant does for his goods, and that if one dealer or distributor could get a better price for a used truck than another, he was entitled to make a better allowance in trading it in.

Walter Y. Anthony, former president of the association, also spoke and admit-

ted that the used car plan in vogue with the Automobile Trade Association would probably work better in the passenger car field than it would in the truck field.

E. J. Cattell, former City Statistician, made one of his characteristic boost addresses, stating that the question of transportation, particularly with motor trucks, would do more to save Europe than anything else. He also sounded a note of warning on the operation of motor trucks and automobiles on the highways, stating that the abuse of a few drivers of the speed laws was reflecting on all users of motor trucks and automobiles and that this abuse would have to be stopped or such vehicles would be legislated off the highways.

Truck-Mounted Sewer Cleaning Machine Reduces City Cost

IN the city of Perth Amboy, N. J., according to the street commissioner, it costs on an average, \$6.96 per basin, to clean sewers by the usual method of hand labor and teams. But P. J. Healey, of New York City, has designed a machine which in the same city does the work for \$3 per basin.

The outfit consists of a unit 50 Selden truck upon which is mounted an espe-

cially designed removable dumping body. Upon the truck platform is a mast and boom, the mast resting upon ball bearings so that the boom may be swung directly over the catch-basin.

A grab bucket, operated by power-driven drums using two cables, one for hoisting and lowering the bucket and the other for opening and closing it, is carried by the boom. The power is taken from

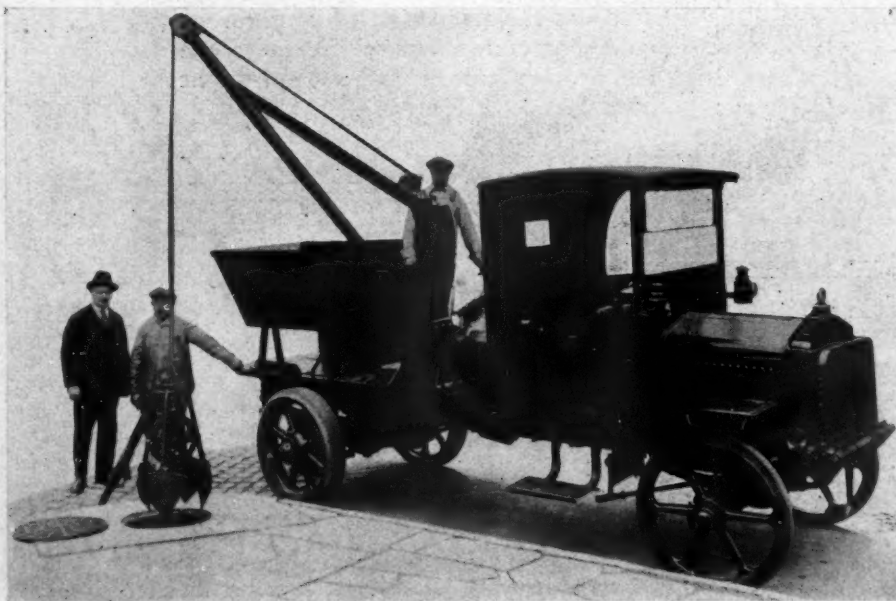
the truck engine. A pole is used to direct the bucket, making it possible to clean the entire circumference of the catch-basin without sending a man below the surface.

The dump body on the device can be used as a container and may be dumped directly into another truck, so that while the second truck is taking its load to the dumping point on scow, the container on the machine can be reloaded, ready to be discharged into the empty truck upon its return.

The operation of the truck in conjunction with the cleaner prevents loss of time. The cleaning machine may be continually operated, proceeding from one catch-basin or sump to another, or to any place from which it is desirable to remove deposits, and without the loss of time which would be experienced were the machine itself sent to the dump.

The grab bucket, which is of the orange peel type, has a large capacity, making the operation of the machine very rapid.

A series of tests made by A. F. Munoz, street commissioner of Perth Amboy, demonstrated that catch-basins can be thoroughly cleaned in twenty or thirty minutes with this truck and two men.



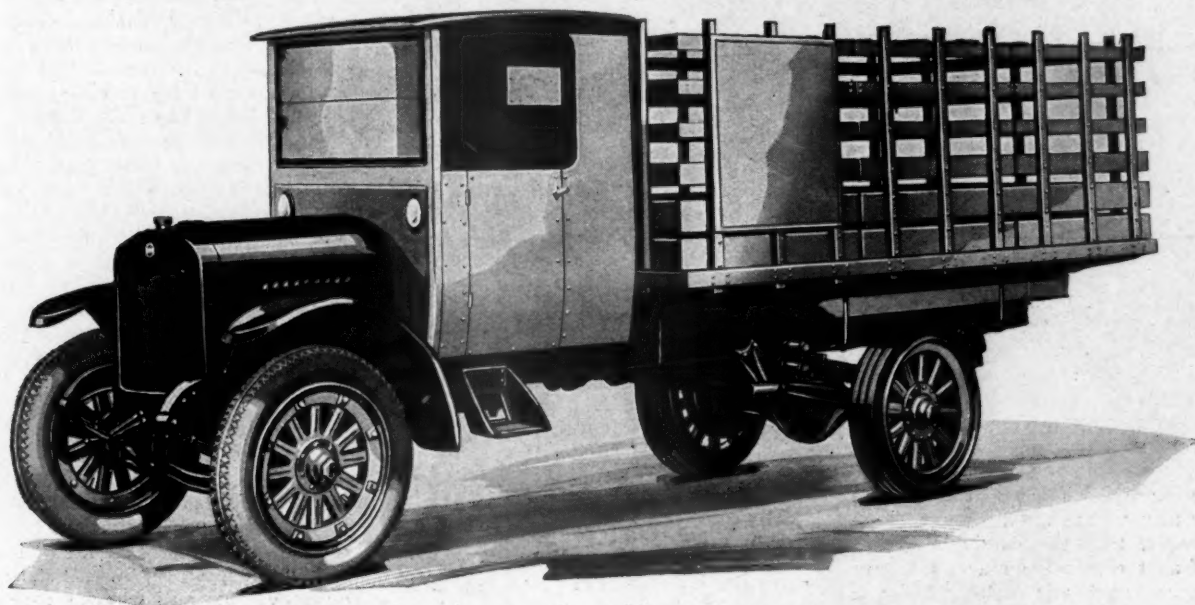
The Orange-Peel Type Grab Bucket is Swung Over and Dropped Into the Basin. A Pole is Used to Direct the Bucket From the Surface. Power Closes the Bucket

The General Tire & Rubber Co., of Akron, O., is planning to double its output in the next 60 days. These facts were made public at a meeting of 150 territorial representatives at the factory recently. The company is now behind in orders, despite its present production of 2,500 tires daily.

During the meeting it was also revealed that contracts had been let for three buildings, each to be three story structures, forming wings to the present plant.

RUGGLES

The World's Greatest Truck Value



1923's Big Opportunity

Ruggles Trucks enter their second year with a bigger, better opportunity for dealers than was dreamed of in 1921.

The public has been quick to see the value in Ruggles Trucks. Sales have increased, ranging from an entire fleet to single units. New territory is being opened by dealers alive to the main chance.

The Ruggles Model 40 keeps pace with the Model 20 in sales results. This 5,000 pound capacity truck completes the line of the dealer who wants to meet practically every transportation requirement.

Begin now to think about your 1923 prosperity. The first step is to write for details of the Ruggles franchise.

**Model 20
(Chassis) \$1195**

Capacity 500 to 2,500 pounds

*All Prices
f. o. b.
Factory*

**Model 40
(Chassis) \$1795**

Capacity 2,000 to 5,000 pounds

RUGGLES MOTOR TRUCK COMPANY, Saginaw, Michigan
Canadian Factory: Ruggles Motor Truck Co., Ltd., London, Ont.

Co-operation *versus* Competition Between Motor Truck and Railway Transportation

(Continued from page 16)

The most important field for co-operation between the railway and the truck is offered by **collection and delivery of l. c. l. freight in large cities.** Comparatively few trucks are used in this service, first, because there is no co-operation between the trucks themselves, and second, because there is no co-operation between the trucker and the railway. As the collection and delivery of l. c. l. freight in large cities is now conducted, the delays to trucks in reaching the station door and in loading and unloading the truck, make unprofitable the use of the truck in station service, so that by far the greater part of this service is performed by horse-drawn vehicles. Truck transportation is only profitable when the truck can be kept moving the greater part of the time.

Notable experiments have been tried in the United States for handling the collection and delivery of the freight of one railway company in a large city, and, so far as I have been able to learn, none of them have been successful. No single railway company receives and delivers freight from and to every part of a large city in sufficient volume to make profitable the collection and delivery of such freight by a trucking organization. I am satisfied, however, that the combine l. c. l. freight of all the railways reaching a city could be collected and delivered by a properly equipped single trucking organization, working in full co-operation with the railways, at less cost than is now paid by the traders in that city for their cartage, and still yield a reasonable profit to the trucking organization.

Terminal Facilities Must be Organized

For many years, the Canadian railways have furnished collection and delivery in the principal cities of Canada, under separate cartage tariffs. The president of one of the largest Canadian railways is my authority for the statement that his railway could not possibly handle its traffic through its present terminal facilities without well organized collection and delivery service.

In England, Scotland and Wales, the railways are furnishing collection and delivery at practically all of their stations. * * * The several general managers with whom I discussed these problems in Great Britain were unanimous in expressing the following conclusions:

(1) That the collection and delivery of freight, at terminal cities and in large industrial centers, by a single trucking organization, is absolutely essential to the most efficient operation of freight stations and that with such a trucking organization co-operating with it, the railway company may control the time of collection and delivery of freight and is able to operate its stations throughout the 24-hour day if necessary, and to use the same platforms and forces for handling in-bound and out-bound freight.

(2) That collection and delivery can be furnished under a separate tariff at rates high enough to produce an actual profit from the cartage operations, after paying all expenses, and low enough to induce 95 per cent of the traders to avail themselves of the organized collection and delivery service rather than to perform it themselves.

(3) That in England, where the general conditions are substantially like those in New England, the railways and the traders have prospered under unified cartage systems, without any substantial additions to station facilities.

Advisable to Pattern After British Methods

In all of these conclusions of the British railway managers I heartily concur and I believe they ought to be adopted by American railways.

Contrast the operations of a large terminal freight station in the United States with a typical British "goods" station.

In this country, the in-bound freight is handled over one set of platforms by one working force and the out-bound freight is handled over another set of platforms by another working force. Each set of platforms and each working force is operated through the entire business day, as freight is taken away from the in-bound station and received at the out-bound station during the entire day. The in-bound platform is piled up with freight awaiting delivery, interfering with the movement of freight across the platform. When the in-bound cars are unloaded, they must be pulled out of the station and set into the out-bound station for loading the following day.

In a typical British station, the same platforms are used to handle not only the in-bound and out-bound traffic, but also a third class of traffic and they are operated through the entire 24-days day.

Handles in, out and Third-Class Traffic

When the day force goes on duty at 8 a. m., a line of cars loaded with in-bound freight is standing on one side of the station platform and a continuous line of trucks or "lorries" are backed up to the other side of the platform. The city is divided into districts and the freight for one district is loaded into one or more lorries, there being more lorries at the platform than there are districts in the city. As soon as a lorry is fully loaded, a driver is summoned by telephone from a nearby stable. He comes with a heavy Clydesdale horse and drives away with a 3-ton load to the proper district, where he makes delivery. When one lorry is loaded and driven away, another empty lorry is backed into its place, loaded and driven away.

Before noon, all of the in-bound freight has been removed from the cars and delivered by lorries. At 1 p. m. the station

platform is clear and ready to receive the out-bound freight which is collected and delivered at the station by the same drivers who delivered the in-bound freight in the forenoon. All of the out-bound freight is collected before 5 p. m., loaded into cars and dispatched before midnight. The platform is again clear and ready to receive the heavy fish and vegetable traffic which begins to arrive at 1 a. m. and is delivered at the markets before 6 a. m. At 8 a. m., the platform is again clear and the empty lorries are standing at the platform ready for the in-bound merchandise.

For the collection and delivery in this country, demountable truck bodies, trailers, or semi-trailers doubtless would be used instead of the British lorries and gasoline or electric tractors would be substituted for Clydesdale horses. On our station platforms, we doubtless would use 4-wheel trailer trucks drawn by electric tractors instead of the old-fashioned 2-wheel trucks which are used in Great Britain. In fact, I left that country with the firm conviction that with our American methods applied to the British system of collection and delivery, much greater efficiency would be obtained and better service would be rendered than is now rendered in Great Britain. * * *

Collection and Delivery of Car-Load Freight

There is a second field for co-operation between the motor truck and the railway, which would require a more radical departure from present methods than the one just mentioned, but which would produce even more beneficial results to all parties concerned. It is the organized delivery of carload freight from public team trucks in large terminal areas.

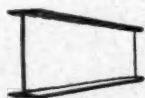
As already stated, this freight is now loaded, unloaded, collected and delivered by the trader, or at his expense. In different cities the trader is allowed from 2 to 5 days within which to unload cars after he has received notice that they are ready to be unloaded.

Generally speaking, there is a shortage of team tracks in the central districts of large cities and it is next to impossible for the railroads to furnish additional team tracks. Cars must be held in the outer yards until there is room for them on the team tracks, and then they must be held on the team tracks until it is convenient for the trader or his trucker to unload them. The necessary consequence is that large terminal districts are full of idle cars, and I think it is safe to say that the average time that box cars are delayed at the port of New York and in the switching district of Chicago is 10 days per trip. If all of the freight cars which carry loads into the port of New York, the switching district of Chicago, and other large terminal areas, could be unloaded on the day of their arrival, they could be loaded out on the same day, or the following day, and the present freight car equipment of the railways would be sufficient to meet all transportation needs for several years to come. * * *

Another field for the profitable use of the motor truck is the transportation of freight between communities which are



Made of rolled steel —and why



The Bethlehem method of making a truck wheel from a rolled steel I-beam produces a wheel that is simple in construction and strong and durable in service.

THE reason for the all-round better service and economy of Bethlehem Rolled Steel Truck Wheels lies chiefly in their method of construction.

Selected Bethlehem steel is rolled into I-beams by an exclusive Bethlehem process. From these I-beams, simple, compact wheel structures are made, by a series of punching and bending operations, performed on cold metal.

The wheel produced by this method is unlike any other wheel, not only in its construction, but in the service it gives.

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ROLLED STEEL TRUCK WHEELS

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served by branch lines of railway, on which the traffic is too light to pay the expenses of any kind of railway transportation. Such branches are almost innumerable and are scattered over every part of the country. They were built before motor transportation was perfected, and, undoubtedly, they have performed a necessary public service, but they have outlived their usefulness. The transportation furnished over such lines could be performed better and more cheaply by motor conveyances over the public highways. No more such branch lines ought to be or will be constructed, if the trucker will take over the field and occupy it intelligently and efficiently. In recent years, I have known of several cases where railways seriously have contemplated the construction of branch lines, to reach small cities and towns, and, on investigation, have found that they could better afford to establish their own truck service, and the proposed branches have not been built.

Who Will Benefit Through These Changes

Five parties are interested in bringing about the changes we have outlined:

The whole public would be benefited in that the city streets would be relieved from the congestion caused by wagons and trucks carrying small lots of freight to and from the railway stations. The new rural highways would last longer, as the co-operation of railway and truck would put an end to long-distance trucking.

The trader would get better service at less cost.

The motor-truck industry and existing cartage companies and private truckers who would co-operate with the railways would vastly increase their field for profitable operation.

The warehousemen would profit by the additional storage now furnished by the railways.

The railways would cut down their terminal expenses and would increase their capacity for service.

The trucker has a distinct advantage over the railway in that highways are constructed by the general public, through some form of taxation, while the railway is constructed at the private expense of the railroad company.

The railway, through taxation, pays a large share of the cost of constructing and maintaining highways, while the trucker pays no part of the cost of constructing or maintaining the railway. If the trucker is to compete with the railway, either he should pay a substantial part of the cost of constructing and maintaining the highway or the railway should be relieved of taxation for highway purposes.

If, however, the trucker, first, would perform that part of transportation furnished by the railway at an operating loss and on which the trucker could make a reasonable profit; second, would cease to compete with the railway for the traffic which the railway can carry at a profit and on which the profit of the trucker is very doubtful; and third, would co-operate

with the railway in handling traffic which requires transportation both by rail and highway; in other words, if the truck would supplement the railway service instead of competing with it, then it would be to the interest of the railway that the expenses of the trucker should be reduced to the lowest possible limit, and, in my judgment, the railway could well afford to pay substantial taxes for highway purposes and to make no objection to the free use of the highway by the trucker.

Show the Public

There is a steady and, for the trucker, an alarming growth of public sentiment in favor of imposing upon the trucker a more substantial part of the cost of maintaining and renewing public highways, which, it is claimed, are destroyed by heavy trucks almost as fast as the highways can be constructed. If the public were satisfied that the truck was only used as a common carrier where the railway could not furnish as good and as cheap a service as the trucker furnishes, I believe the public would cease demanding that greater burdens be placed upon the trucker, which would increase the cost of his service.

No single scheme of operation will fit all terminal situations.

The situation, at the port of New York seems to me to demand the use of motor trucks with demountable bodies or trailers to move the freight by way of ferries and city streets between railway terminals on the New Jersey shore and inland off-track stations in the different industrial centers of New York. The movement across the rivers is now made principally in freight cars on car floats. By the use of ferry boats and inland off-track stations, the railroads would be able to release large holdings of very valuable dock property on both sides of the rivers and such property would become available for the docking of ocean steamships for which there is great demand.

Inland Stations Economical and Meritorious

The inland stations could be constructed on much less valuable property, and if used as universal stations for all railways and steamship companies, they would offer superior advantages for upper floors which could be devoted to warehousing or other industrial purposes. I have been assured by New York real estate men of great experience that they would undertake to secure sites for such inland stations in all parts of New York and the construction thereon of buildings in which the first floors would be adapted for use as railway stations. They were willing to guarantee that the station floors would be leased permanently to the railway companies at nominal rentals on condition that the occupants of the upper floors might have access by elevators to the station floor for the receipt and delivery of freight, without any expense for cartage.

All the traffic now passes through the streets of New York. An organized truck service would substantially reduce the number of vehicles on the streets and the cost of the service would be much less

than the expense of the present car float operations.

The situation at Chicago is more complex. The distances are so great and the railway systems so completely cover the city that I think the railways must supplement the truck service for movements over long distances.

In Cincinnati, an organized truck service is in operation and conducts most of the transferring of freight between the city stations of all the railroads centering there. All stations are equipped with the necessary machinery for handling loaded and empty 5-ton, demountable, truck bodies, which are loaded and unloaded on the station platform and promptly moved by chasses, under the control of a truck dispatcher. This station to station service could easily be extended to the various industries. In fact, some of the largest traders in Cincinnati already have requested such extension service.

At St. Louis, organized motor truck service with trailers and semi-trailers has long been in operation between the freight stations at East St. Louis and inland stations in St. Louis. The service conforms closely to that outlined for the port of New York, except that the trucks cross the river on high bridges instead of ferry boats.

At St. Paul and Minneapolis, the Great Northern and Northern Pacific railway companies for many years have used large box cars as freight stations for out-bound l. c. freight in different parts of both cities. When the cars are loaded, they are switched to a common transfer station, about half way between the Twin Cities, and there the freight is transferred from the station cars to line cars for any destination on either railroad.

The Chicago, Milwaukee & St. Paul Railway Company is using a similar service at the Twin Cities. The president of the latter company, several years ago, assured me that, by substituting that service for the separate stations previously used in each city, his company had been able to move its increasing freight traffic with 40 per cent less cars than previously were required for movement from separate stations in each city.

I believe that for every city there is a practical solution which, with the full co-operation of railways and trucks, would result in the movement of freight through the city stations as soon as it arrives there and would thus enable the railway to furnish much more transportation service without increasing its facilities and without increasing its charges for transportation.

Conclusion

The truck should supplement the railway and not compete with it. Wherever complete transportation can be furnished by the truck more efficiently and cheaply than by the railway, the truck should be used. Wherever the railway service is adequate and profitable and less expensive than truck service, the railway should perform the service. Where the best and cheapest service can be furnished profitably by the railroad and truck combined, the railway and the trucker should co-operate in furnishing that service.

ROSS STEERING GEARS



OVERWHELMING PREDOMINANCE
Won by
QUALITY and SERVICE

181 According to our present active sales record, 181 motor truck manufacturers are now using Ross Steering Gears as standard equipment, this number including many of the biggest and best known manufacturers in the country.

61 Checking with the complete list of motor truck manufacturers as given in the Commercial Car Journal for October 15, 1922, we find only 61 manufacturers listed who are not using Ross Steering Gears, this number including many who manufacture their own steering equipment.

This overwhelming predominance is not due to chance; nor is it due to price, as Ross Steering Gears are not *cheap* gears. It has been won on superior quality in design and manufacture, on the easy steering, safety and reliability which Ross Steering Gears guarantee.

Ross Passenger Car Gears

Ross Steering Gears are now available also for passenger cars, offering the same easy steering, safety and reliability which have won predominance in the motor truck field.

Write for further information regarding Ross Steering Gears for motor trucks, passenger cars, motor buses, fire trucks or tractors.

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MOTOR TRUCKS
PASSENGER CARS
MOTOR BUSES
FIRE TRUCKS
and
TRACTORS

The Steering Gears that Predominate on Motor Trucks

What One Man Thinks of the Body Business

(Continued from page 19)

ment—those few who have built their business on a rock but are having a hard struggle holding it there in the face of so much disorganized illegitimate competition. Next to them, those who are suffering the most are the larger well organized builders who are trying to co-operate with the truck dealers.

They are having a hard time trying to meet the list prices of the smaller body makers and still give truck dealers a living margin of profit. How long they can continue to compete with the little local fellow, who is willing to take for his profit just good foreman's wages, is a problem.

While the larger operator can standardize on bodies that are special so far as the truck maker is concerned and get his prices down with quantity production, he must face the "home industries" competition that have no advertising expense, no salesmen on the road, no large investment in lumber and hardware and none of the other items of overhead to contend with.

The small operator, knowing little about merchandising and caring less, has but little overhead expense and practically no sales expense, thinks that ten or fifteen per cent is enough for Mr. Truck Dealer and the big operator has got to meet it. Quality is a lost argument in explaining the difference in list prices.

Freightage Big Deterrent

The few large makers with good plants and fine equipment are further handicapped by freight rates unless they are located in metropolitan centers where there is enough nearby business to absorb their production.

The freight from factory to dealer on the body or on the chassis from truck plant to body factory and then re-billed to dealer is a big item. Of course, from the consumers' standpoint, the existence of the local builders is to their advantage in that respect. And some of them are not immune from the temptation to sell direct at an inside price to the truck buyer.

But it must be said of those who are starting in a small way with the best intentions and have the great American right to develop and grow, there are some who are willing to stand and fall on a particular deal with the dealer. They work conscientiously with the dealer and pool their chances to sell the body with the dealers' chance to sell the truck while others will play one dealer against the other and burn both ends of the candle against the middle.

This is being done every day and it is making it hard for the dealer.

The motor hearse business is developing very slowly and while part of the fault lies with the dealer for not pushing that line, it is a fact that when a hearse body builder will come right into the town and quote the undertaker his very best wholesale price direct, for fear that the next hearse maker will if he don't, there is not much encouragement left for the dealer.

There are so many in the body business that it is doubtful if a body builders' association would in ten years correct this evil, but there are not so many companies building hearses and ambulances but that they could correct this if they would but make the start.

Body discounts must be put on a parity with truck discounts if anybody from the dealer to the maker is ever going to make any money. The experiment a Pennsylvania body builder is making this year is very refreshing. He has an eighth of a million invested and it takes nerve to put across what he is trying to do, but it is to be hoped that he succeeds and more copy his methods.

"We decided that it could be done," he told the writer, "and we raised our prices so we could give the dealers a discount as large as they are getting on their chassis. And we are going to stand our ground just as long as we dare. So far we have scored a perfect success. Our business is growing. The distributors are particularly well pleased because they can now afford to help out their dealers on special bodies where before we were quoting dealers and distributors the same short discounts.

"Some of the distributors now feel that they can stock some of our goods and they are giving their dealers better service. Our whole line consists of bodies that are special with several truck makers, but with us they have become standard.

"We will continue our experiment as long as we can and when we can't, we will by necessity return to the old cut-throat methods."

A body builder with these principles and the nerve to use them should be rewarded, but will he be?

One Solution: A Body Builders' Association

The need today is for a body builders' association, but to set prices and regulate discounts might be in violation of our federal laws. The remedy, however, seems to rest with the dealers, dealers' associations, the larger body makers and the truck manufacturers. The smaller body makers would doubtless fall in line or be eliminated in the same way in which a great many curbstone automobile dealers were. In the first place, the truck dealers should refuse to deal with any body maker who can't give a good discount or won't. If worst comes to worst, a few bodies imported from the outside and sold at cost might cure him.

If not, and regardless, the best plan would be for truck dealers to carry a small investment in bodies, say one of a kind that are most called.

"I built my truck business on my body business," one dealer tells me. "I have been handling a line of trucks that have been standard for several years and I found that outside the factory bodies, there were about ten other types that had the call. So I stocked them and it helped my truck sales wonderfully.

"I bought a dozen pair of wooden horses, had them varnished up and set

the bodies on them making a very imposing display. My competitors seemed to either lack nerve, perspective or capital. While they were writing around the country getting special quotations, I was filling the orders. Furthermore, I got away from the trouble that customers invariably caused me on made-to-order bodies. They always wanted alterations after the job was half built."

Any dealer with a little nerve can do this. It gives him a chance to incorporate his own ideas in body construction and better yet, it gets away nine times out of ten from the overloading evils. Let a customer design his own body and he will allow for too much overload, whereas if you have the body in stock, he will take what you have rather than wait.

The body makers themselves can do a lot to rectify the errors of their clansmen, that is, those who have good sized plants and are doing volume business. Has it ever occurred to you how few the cases are that makers of the so-called special bodies have located their plants in the same town with the big truck producers?

Centralize Where Chassis Are Made

Just the other day one of the salesmen pointed out a big opportunity for some body maker in his own town, where three different automobile plants are located but not one single truck body plant, the one-at-a-time shops excepted. Nearly ten thousand trucks are being shipped every year from that point without bodies, yet somebody somewhere is making them.

"If some plant would move here, they could have a cinch and if they would work with us and refuse to sell bodies that were too heavy or too long, we certainly would reciprocate with our co-operation.

"Our biggest problem today is to keep owners from overloading and these small body makers either don't care or don't know: at least they are willing to build anything the buyer wants whether it is injurious to the truck or not."

Of course, a company with their plant already located may not care to make the move but it would pay them to install a branch in these factory towns, ship in by carload, mount on the chassis and let the finished jobs go back to the truck maker to be shipped in carload with two other jobs to the dealer. The advantage of freight savings is a big item.

The final remedy would be for the factories to install equipment departments apart from regular production. Put it in charge of a competent man and keep the "standard" special jobs on hand. The investment necessary to carry out this idea would be small in comparison and the matter of prompt delivery would mean much to their dealers in competition out in the field.

Ten thousand dollars would cover the inventory at any time, provided the man in charge knew his business and could gauge his purchases to make the turnover frequent. It is not too much to say that this department would pay greater dividends than the factory.

But something must be done. So why not somebody start something before the present situation gets under greater headway?

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TABLE OF CONTENTS

	PAGE
Advertiser's Index	156
Buyers' Index of Reading and Advertising Pages...	150
Commercial Car Specifications	39
Editorials	19
New Commercial Cars	29
News of the Trade, Including Personals, Factory Items, Etc.	20
Pneumatic Truck Tire Table	52
Replacement Table	33
Truck Equipment and Appliances	54

SPECIAL ARTICLES

Not an Exposure, But an Exposition for Betterment..	9
Some Reasons Why the Dealer Should Sell Trailers	11
Accepting the Trailer as an Economical Transporta- tion Factor	12
A Method of Reducing the Idle Time in the Repair Shop	13
A Plea of Better Business Principles	14
Parts and Vehicle Builders Meet	15
Making Inspection a Specialty	16
Program for Chicago Convention of A. R. B. A.	17
Development of the Electric Vehicle Battery	18
Factory Service Men Endorse Local Service Asso- ciations	25
Industry Now in a Third and Most Important Period	27

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Sales for 1922 in the Commercial
Car Field exceeded a billion dollars.

Here's how the business, approxi-
mately, was divided:

Commercial Cars Built in 1922	-	\$250,000,000
Tires for Replacement	-	175,000,000
Gasoline	-	250,000,000
Lubricating Oils and Greases	-	37,000,000
Special Bodies	-	60,000,000
Replacement Parts and Supplies,		73,000,000
Brake Lining	-	\$8,500,000
Batteries	-	6,250,000
Bearings	-	11,500,000
Piston Rings	-	3,700,000
Pistons	-	6,500,000
Radiators	-	6,800,000
Springs	-	8,250,000
Ignition Apparatus,		6,500,000
Miscellaneous	-	15,000,000
		<u>\$73,000,000</u>

Special Equipment (Hoists, Winches, Cranes, Etc.)	15,000,000
Labor (Repairing and Overhauling)	150,000,000

TOTAL - - - - \$1,010,000,000

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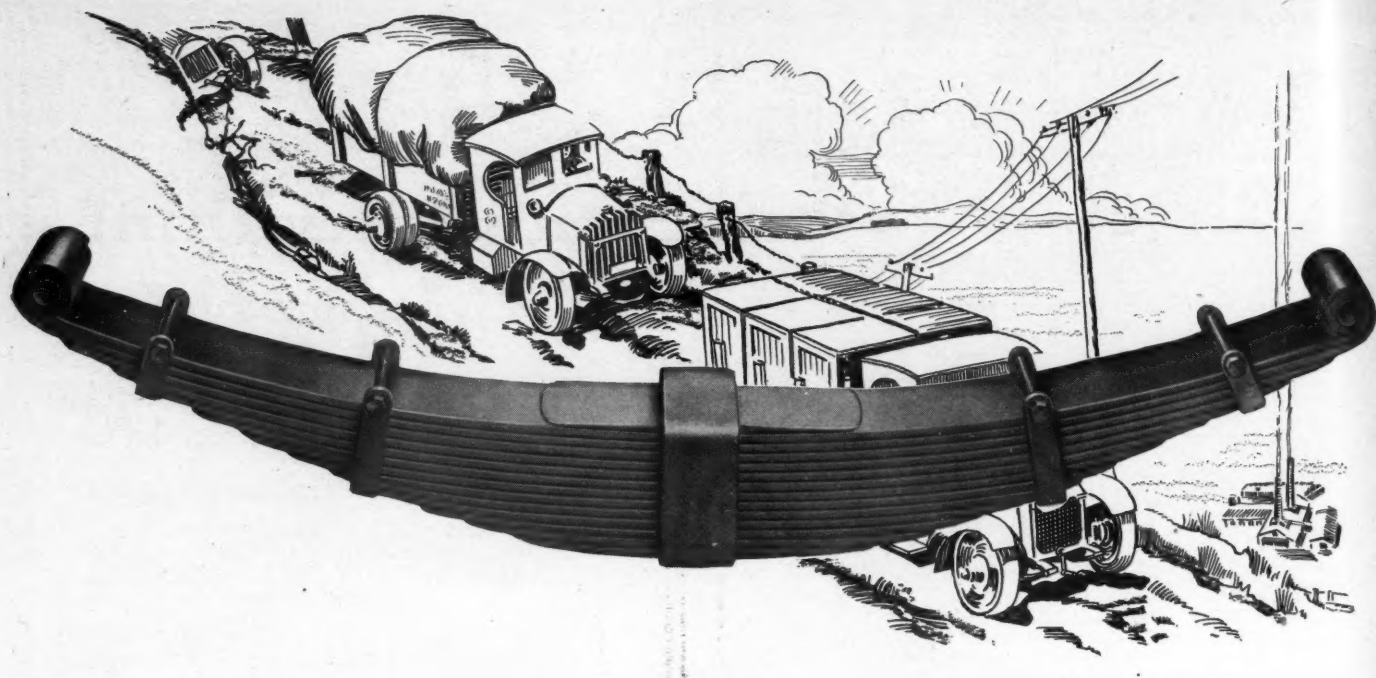
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